

A background image of a target with concentric green and white rings. Two arrows are shown hitting the bullseye. A dark teal horizontal band is overlaid on the target.

Payment System Improvement – Public Consultation Paper

Federal Reserve Financial Services

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Response

General

Q1. Are you in general agreement with the payment system gaps and opportunities identified below? Please explain, if desired.

Yes, however, there are additional gaps and opportunities that are not mentioned that should be part of a complete solution.

Continued End-User Check Writing

Checks continue to be used persistently for certain types of transactions and we believe this is due to the specific utility value of certain features of checks. Since checks are returned to the maker (or at least an image) with an endorsement, a full record of the transaction is available to the maker, and due to image processing, the receiver. Additionally, the ubiquity of acceptance and the relatively low cost of processing offer other features that engender their continued use.

- ◆ FIS offers complete solutions for managing check payments and receivables processes, end- to-end, from statement generation to payment posting. We plan on continuing investing in our check processing solutions to help organizations streamline operations, improve working capital management and meet business and customer service objectives. FIS has the ability today with PayNet, FIS' real-time network, to align to the electronification of these transactions as the market evolves to meet the needs of our clients. As outlined by the Federal Reserve, we see this transition over the next 10 years for business checks but much faster for consumer initiated transactions.

Challenges in Converting Businesses to Electronics

FIS believes there are many challenges with electronic transactions. However, we feel that over time they can be overcome by leveraging and enhancing the Electronic Funds Transfer (EFT) Debit networks to expand to the ISO 20022 Standard for Financial Services Messaging. Because ISO 20022 has the ability to include remittance information in a payment message, adoption of this Standard would facilitate electronification of business transactions. Corporations and banks can utilize this Standard to create straight through real-time posting of transactions both domestically and for cross-border payments.

- ◆ FIS is enhancing PayNet, FIS' real-time network to the ISO 20022 format to facilitate electronification of business and cross-border payments.

Closed Payment Communities

The current closed networks of various alternative payment systems create a significant barrier to wider adoption of mobile payments. Consumers are more likely to use traditional payment systems than join a variety of payment alternatives. The card associations actually can be construed as large scale examples of closed payment communities, which now are creating barriers to innovation.

- ◆ FIS supports open networks by having guidelines for interoperability between network operators. This has been solved previously in real-time networks where ATM networks interoperate based on guidelines between parties. FIS will provide open standards for PayNet to interoperate with communities that meet the guidelines in the Network Operating rules. This could be a valuable role for the Federal Reserve in accelerating adoption.
-

Lack of Contemporary Features in Traditional Payment Channels

Confirmation of good funds is made at the initiation of the payment. It is paramount for the adoption of any real-time network that the sender and receiver have timely notification that the payment has been made.

- ◆ FIS PayNet has been designed to provide originators and receivers good funds and notification of payments.

Slowness of U.S. Payments

Most other industrialized countries that the United States regards as principal competitors and trading partners already have real-time payment networks or are in the process of implementing them. FIS believes real-time payments will be critical to maintain U.S. global competitiveness. Consumers and businesses are demanding real-time payment options. Technology exists today that could facilitate the widespread use and application of real-time payments and meet the demands of today's fast-paced financial services environment.

- ◆ As the largest FinTech company, and in response to our customers' needs, FIS is taking leadership and investing heavily in real-time payments technology and product innovation, building efficient solutions that offer real-time data exchange to facilitate real-time payments.

Mobile Technology Revolution

Providing "cash-like" payment performance from anyone to anyone, anywhere, in real-time, from consumers' mobile devices is functionality that will make mobile payments a valuable alternative to traditional payment methods. In order to become a preferred method of payment, the "customer experience" of a near-real-time payment system must be more convenient and valuable for the consumer.

- ◆ FIS is investing in our Mobile Wallet technology and integrating to PayNet for consumer and cross-border payments.

Obstacles in International Payments

There are many barriers to creating an effective near-real-time cross border payments network, including regulatory, legal and privacy issues, data sovereignty issues and ownership or stakeholder issues. Notwithstanding all of this, establishing a global standard for communication and interoperability is important as cross-border transactions increase in a more globally connected economy.

- ◆ FIS is investing in and supports the adoption of the ISO20022 Standard as the foundation of a new network infrastructure for cross border. Network guidelines need to be adopted for good funds models globally. PayNet provides a set of Operating Network rules that allows banks globally to join and transact real-time consumer and business payments.

Security Concerns

Security is paramount to the success of a real-time network. The problem is less about whether the threats are being adequately addressed than it is the lack of a consistent, unified payment policy that can maximize reuse of risk management resources, enhance information sharing and prevent loss of data during the handoff of a transaction between two processors.

- ◆ FIS supports leveraging the EFT Debit networks because this infrastructure has been hardened and has evolved with the continued threats in payments systems today. PayNet leverages the NYCE infrastructure and security standards. This approach maintains compatibility with existing financial institution EFT systems and security guidelines providing a cost-effective solution for real-time payments.

Further, FIS has aligned not only to the payment system gaps outlined but also is aligned to the five desired outcomes listed by the Federal Reserve. More specifically:

Ubiquitous Real-Time Retail Payments – This is the number one problem that needs to be overcome for mainstream adoption for real-time payments. FIS is deploying PayNet’s real-time payments network in the U.S. market without the benefit of a mandate now, and we are confident that we will achieve a critical mass of participants in the near term. However, clear rules of the road by the Federal Reserve will be required for real-time payments to attain meaningful consumer adoption and the same is true among companies that provide banking and payment services. Guidelines and standards for openness and interoperability for network operators, identity providers and financial intuitions will be necessary for ubiquity.

Improved Payment System Efficiency – Over the long run, greater electronification and process improvements have reduced the average end-to-end (societal) costs of payment transactions and resulted in innovative payment services that deliver improved value to consumers, businesses, and governments. FIS is investing in an EFT solution because this approach maintains compatibility with existing financial institution EFT systems and security guidelines, providing a cost effective solution for real-time payments.

Improvements in Cross-Border Payments – Consumers and businesses must have a better choice in making convenient, cost- effective and timely cross-border payments from and to the U.S. FIS’ PayNet approach to create a global Good Funds Network that leverages the ISO 20022 standard to support and standardize the remittance information needed for cross border real-time payments.

Enhanced Payments System Safety and Security – The industry must stay vigilant to promote the security of the payment system from end-to-end amid a rapidly evolving technology and threat environment. FIS’ approach to create PayNet and leverage the EFT infrastructure allows consistency with the existing financial institution EFT systems and security guidelines, providing a cost-effective solution for real-time payments.

Strategic Industry Engagement – The Federal Reserve has done a superior job in outreach for modernizing the payment systems in the U.S. To facilitate a cost effective solution for all and based on market demand for real-time payment capabilities, FIS has already begun investing in modernizing its core processing systems to further broad applications of real-time payments, aligning its development priorities to address the gaps identified by the Federal Reserve in the Payment System Improvement Paper. With guidelines and leadership from the Federal Reserve, FIS believes it can leverage the existing EFT infrastructure to deliver global real-time payments that are secure and ubiquitous within the next three to five years.

i. **What other gaps or opportunities not mentioned in the paper could be addressed to make improvements to the U.S. payment system?**

a. ***Inconsistent payment system economics***

Payment systems in the U.S. evolved separately over time, using different business and operating models. For example, checks clear “at par,” which is to say at face value, while card payments clear at a discount. This does not mean that checks cost no money to process, only that the cost is funded through a different method, such as user fees or cross-subsidies from other products. These discrepancies can lead to confusion and suboptimal use of resources. For example, real-time ACH has met with opposition because the existing business model for ACH processing lacks any kind of interchange structure that would provide an incentive for banks to offer it. Any solution must take into account the existing inconsistencies in payment system economics and either resolve those inconsistencies or offset them through its own pricing model.

b. ***The value of the data surrounding the payment***

New data storage, transport and analysis technologies combined with the ubiquity of mobile and online touch points, have increased the value of the data surrounding the payment at the same time as the cost of payment processing has declined. This suggests a possible solution to the problem of rationalizing the existing industry level pricing structures without meeting significant resistance from some entrenched interests; new revenues from data sharing could offset losses from pricing rationalization. Any such tradeoff would have to be part of a larger market reorganization including data owners and payment service providers.

c. ***Lack of transparency***

The fact that payment processing is embedded in the U.S. banking system means that it is difficult to determine the actual costs incurred and revenues derived by banks from payments. Even the banks themselves often lack the cost accounting systems necessary to answer these questions. For example, checks and debit cards are entwined with the demand deposit account (DDA) in a way that makes it difficult to determine the market-clearing price for either service. An attempt to regulate one aspect of the system (such as debit card interchange) without considering the other parts leads to unanticipated and undesired results (such as an increase in consumer DDA fees). Lack of data at the macro level prevents a common understanding of the problem, leaving public opinion vulnerable to disinformation. It also erodes trust, making it more difficult to bring stakeholders together around a shared vision of the future.

d. ***Opportunity to clarify the differences between banking and payment services***

Although banking and payments have historically been intertwined in the U.S., it is possible to view them as separate functions. Indeed, there are many companies whose primary business is payments, and which do little or nothing pertaining to saving and lending. The European Union has recognized this fact with its Payment Services Directive (PSD), setting out a separate regulatory framework for payment service providers. Adopting a similar strategy in the U.S. would promote innovation and modernization by creating a more stable business environment for non-bank payment service providers.

Q2. Are you in general agreement with the desired outcomes for payment system improvements over the next 10 years? Please explain, if desired.

Yes, although the market is already moving in that direction, we believe that a more proactive strategy by the Federal Reserve will accelerate the progress towards uniform and ubiquitous outcome.

i. ***What other outcomes should be pursued?***

There should be greater consistency in the way payment systems are regulated.

The Federal Reserve should also conduct real-time pilot initiatives with various approaches in 2014 to get engagement, exploration and evaluation of solutions. This learning approach will accelerate market awareness, learning and adoption of real-time payments.

Q3. In what ways should the Federal Reserve Banks help improve the payment system as an operator, leader, and/or catalyst?

The Federal Reserve Banks, in cooperation with other regulatory agencies, need to take a more active leadership role in defining the future configuration of the U.S. payments infrastructure. In light of recent history and the current economic imbalance in the system, industry stakeholders are unlikely to agree among themselves on a path forward. Every country that has adopted real-time retail funds transfers has done so with support, and often explicit incentives and/or penalties, from the national government.

Ultimately, the problem is political, not technological -- so the solution must be political. The Federal Reserve's expertise in payments and its politically neutral character makes it the natural agency to lead in educating politicians and the public about the issues and possible solutions. The Check 21 law forms a valuable precedent in this respect.

Ubiquitous Near-real-time Payments

Q4. In discussions with industry participants, some have stated that implementing a system for near- real-time payments with the features described in the second desired outcome¹ will require coordinated action by a public authority or industry group. Others have stated that current payment services are evolving toward this outcome and no special action by a public authority or industry group is required.

i. Which of these perspectives is more accurate, and why?

We believe that progress toward a near-real-time payments system with the features described in the second desired outcome will require coordinated prescriptive action by a public authority. The private sector should execute the said Federal Reserve guidance. The following important characteristics of a bank centric identity trust framework are:

1. Coordinate prescriptive actions by public authorities and public-private consortia efforts so cloud-based Identity & Privacy Services² can flourish for the benefit of banks and their customers. The Federal Reserve System should define an Identity Trust Framework that:
 - a. Is of, by and for banks and
 - b. Defines the liability responsibilities while ensuring that operational, legal, and security obligations are met.
2. Identify and assess operational support³ mechanisms that:
 - a. Support Identity Trust Framework pilots
 - b. Follow guiding principles of confidence, privacy, choice, and innovation.
 - c. Position banks at the center of their customers transactional lives.

NOTE: FIS PayNet as well as other private sector participants⁴ has begun evaluating and piloting such frameworks. This highlights the demand for instant inclusive cloud-based, bank-centric instant payments.

3. Lead BITS, the Technology Policy Division of the Financial Services Roundtable, and other industry consortia with a vision for inclusive, neutrally positioned operations of critical sub-components.
 - a. Emphasize the Federal Reserve's inherent capability to operate in a safe manner that protects transaction privacy from unlawful access.
 - b. Provable sufficient transparency of software design as necessary to achieve inter-operability among various Trust Frameworks in other global regions.

Financial Institutions are ideally positioned for identity proofing consumers, corporations and issuing credentials and new identity attributes. Financial Institutions should receive compensation for accepting the responsibilities of Identity Provider duties in an Identity Trust Framework.

¹ (ubiquitous participation; sender doesn't need to know the bank account number of the recipient; confirmation of good funds is made at the initiation of the payment; sender and receiver receive timely notification that the payment has been made; funds debited from the payer and made available in near real time to the payee)

² Known as an Identity Trust Framework in the NIST/NSTIC taxonomy.

³ Operational support: the Trust Framework for Banks is secure, efficient, easy to-use, and interoperable.

⁴ Microsoft, Comerica Bank, Payment Pathways and Authentify

The market continues to evolve. FIS is deploying a near-real-time payments system in the U.S. that is widely conforming to the NIST-NSTIC FICAM principles. FIS is doing so without the benefit of a Federal mandate. We are confident that the threshold number of participants to tip systemic adoption is attainable in the near term. Increasing numbers of both Originating and Receiving banks are moving through the various stages of on-boarding as this paper is being written, flowing an ever-increasing number of live transactions through the network.

While a mandate will offer certain advantages that could accelerate the adoption of this or similar networks, it also will introduce elements of resistance into the market, which could create the obverse of the intended consequences. The introduction of faster payments into the U.K. provides an effective case study of mandated introduction.

ii. What other perspective(s) should be considered?

The opportunity cost of inaction should be considered when planning a strategy for implementing near-real-time retail payments. Beyond the obvious economic costs to society, there is the danger of political or judicial decisions that are narrowly targeted at redressing a particular problem in the payments system, without considering the systemic implications. The Federal Reserve needs to have a strategy for influencing such decisions, preferably by resolving problems before they reach the courts.

The Federal Reserve inaction weakens banks because intermediaries distance consumers from their banks. The Federal Reserve should champion what banks recognize as sustainable transaction-based economic models. Since every transaction consists of risk event the risk-bearing entities should be compensated in a manner that is proportional to their respective part of transaction. Creating sustainable economic incentives for both the payer and payee bank and including a compensation for carrying the regulatory and operational burden should be considered in the economic model.

Q5. The second desired outcome articulates features that are desirable for a near-real-time payments system. They include:

- a. Ubiquitous participation**
- b. Sender doesn't need to know the bank account number of the recipient**
- c. Confirmation of good funds is made at the initiation of the payment**
- d. Sender and receiver receive timely notification that the payment has been made**
- e. Funds debited from the payer and made available in near-real time to the payee**

i. Do you agree that these are important features of a U.S. near-real-time system? Please explain, if desired.

Yes, we agree that these are important features of a U.S. near-real-time system. Original FIS research with more than 1,500 customers of U.S. financial institutions clearly indicates a need for security, speed and the convenience of near-real-time non-card payments (see Q21 for further details on this research). Consumers are accustomed to these benefits in every other aspect of their lives – from instant messaging and texting to one-click checkout when shopping online. The time lag associated with non-card payments is out of sync with today's customer expectations.

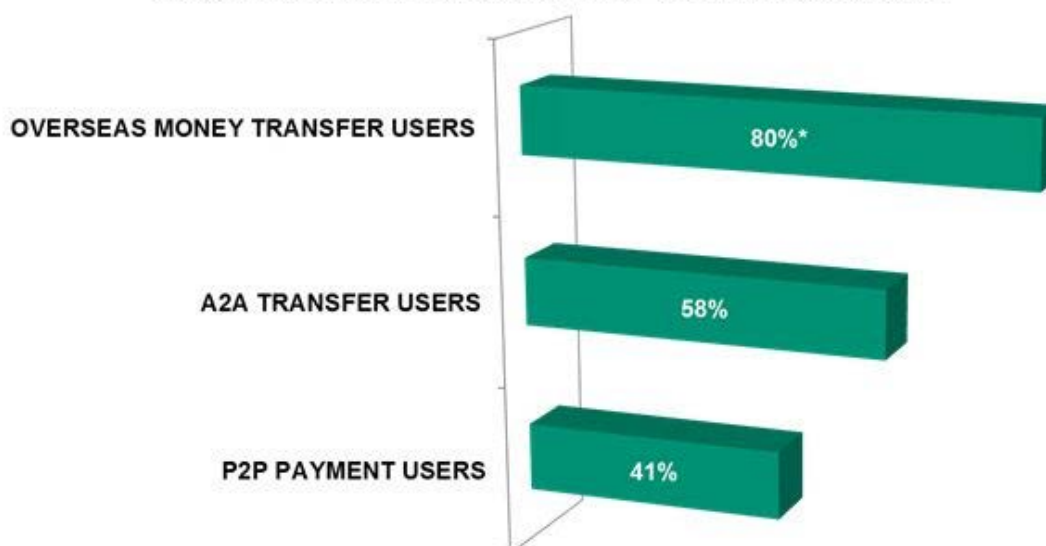
Non-card payment systems in their current configurations do not deliver the convenience, the speed and, especially in the case of foreign money transfers, the peace of mind at an affordable price that customers want and expect. As demonstrated in the chart below, large percentages of consumers believe that funds from their accounts should be instantly available to payment recipients and applied to their desired purpose.

- Faster payment was rated as being important by eighty percent of outbound foreign money transfer users, because it provides both senders and recipients with peace of mind.
- The majority (58 percent) of consumers who currently conduct A2A transfers also want to be able to transfer their money between accounts quickly.
- A large percentage (41 percent) of P2P users want recipients to be able to access funds immediately.

Potential adopters of outbound foreign money transfer and P2P real-time payments most often want to use real-time applications to send money – as gifts, for emergencies and even for non-emergencies – to family members and friends.



PERCENT OF USERS WHO BELIEVE IT IS EXTREMELY/VERY IMPORTANT FOR THEIR RECIPIENTS TO RECEIVE ACCESS TO FUNDS IMMEDIATELY



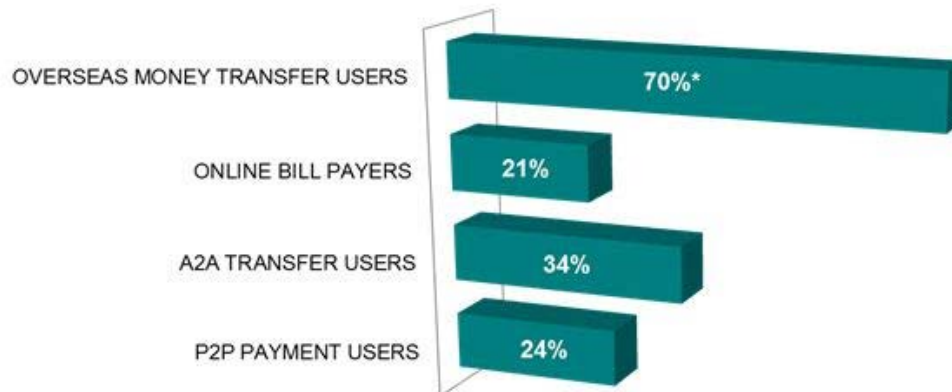
* Read as: 80 percent of overseas money transfer users believe it's important for their recipients to be able to use the money they send to them immediately
Source: FIS and Ipsos-Vanitis Real-time Payments Research Study, March 2013, n = 1,508

FIS' research found that similar percentages of consumers believe that various real-time payments applications would solve a problem or fulfill a need.



REAL-TIME PAYMENTS WOULD SOLVE PROBLEMS/FULFILL NEEDS FOR MANY CONSUMERS

REAL-TIME PAYMENTS WOULD DEFINITELY/PROBABLY SOLVE A PROBLEM OR FULFILL A NEED FOR YOU



* Read as: 70 percent of overseas money transfer users believe that real-time payments would probably or definitely solve a problem or fulfill a need.
Source: FIS and Ipsos-Vantiv Real-time Payments Research Study, March 2013, n = 1,508

There is clearly an unmet market need for open, near-real-time non-card payments. However, as is the case with all payment types, consumers want basic assurances regarding the integrity of the payment service or network and they desire assurances that there are “rules of the road” that protect them from monetary loss or compromised personal information (see chart below).



PROTECTION FROM FINANCIAL LOSS OR COMPROMISED PERSONAL INFORMATION ARE KEY REQUIREMENTS THAT DRIVE CONSUMER PAYMENT SELECTION

Attributes Important to Consumers When Selecting a Payment Method



* Read as: 75 percent of consumers believe that protection against fraud and other crimes is an important attribute when selecting a payment method
Source: FIS Survey of Consumer Payment Preferences, Feb 2012; n = 3,205

Clear rules of the road will be required for real-time payments to attain meaningful consumer adoption, and the same is true among companies that provide banking and payment services.

FIS does not necessarily agree with the premise stated in section b. that the sender does not need to know the receiver's account credentials. Electronic payments, with the exception of digital crypto-currencies, depend on the exchange of account credentials at some point, either in the foreground within the context of the sale or transaction, or in the background, through a means of tokenization. The motivation to minimize the exposure of account credentials stems from a desire to protect access to the underlying account and minimize the potential for fraud. However, account numbers are nothing more than an abstraction of the account holder's store of value or liquidity, and the ABA number is simply an abstraction of the bank.

Similarly, card numbering and BIN methodologies originated as an abstraction of the cardholder's access to credit at a given bank (another store of value or liquidity), and when the same numbering structure was extended to debit cards, it became an abstraction of the account number, or truly, an abstraction of an abstraction. In each case as the numbering methodologies and their payment functions were understood by criminal elements, the information was used to perpetrate fraud. If the industry were to substitute some other persistent token or symbol, such as an e-mail address or mobile number for existing account credentials, it would just become a third-order abstraction and criminal elements would find ways to subvert it for fraudulent purposes as well as the older abstraction methodologies. Since the existing account credentials, or abstractions are not going away, FIS believes that encryption, identity validation through the use of a PIN or other means, robust KYC and activity monitoring are much more effective fraud

deterrent than some sort of account credential masking. Another effective fraud deterrent is to remove account credentials altogether from the point of the transaction and substitute a single use token, moving the exchange of account credentials from the foreground to the background. FIS has enabled these technologies in other product offerings outside of the scope of this paper.

ii. What other characteristics or features are important for a U.S. near-real-time system?

First, there is a need for consistent rules for consumer, commercial and international payments. Particular areas of concern are the time frames for dispute resolution, liability for fraud, and finality of payments. For example, under FRB Regulation E, consumers are entitled to an extended dispute window for electronic funds transfers, as well as a low limit on liability for fraud. These protections have had the unintended consequence of delaying availability of funds as financial institutions seek to mitigate their good funds risk. Better technologies for authentication are now available that enable us to revisit the need for such expansive consumer protections. Near-real-time retail payments will not be feasible without changes to reflect the particular risks associated with faster collections.

Second, as outlined above in Q4.i, there is a need for a cloud-based Identity & Privacy Services which defines the liability responsibilities while ensuring that operational, legal, and security obligations are met. An identity system that is secure, efficient, easy to-use, and interoperable will promote “confidence, privacy, choice, and innovation.” With a real-time network there are better ways to ensure a participant is the actual user or is “authenticated” in real-time by the authorized party. For example, a payment network may generate a Service Provider Master Key (SPMK) corresponding to an originator or an associated Transaction Origination Point (TOP), may utilize the SPMK to generate a Participant Authentication Key (PAK) associated with a financial institution, and may utilize the PAK to generate a Payment Instrument Key (PIK) associated with an account at the financial account (such as an account owned by initiating user).

Validating the account that is owned by the appropriate party is paramount to the success of this network. Incorporating rules that authoritative parties must participate and make this information available to the network in a secure manner would accelerate the adoption of the real-time network.

Q6. Near-real-time payments with the features described in the second desired outcome could be provided several different ways, including but not limited to:

- a. Creating a separate wire transfer-like system for near-real-time payments that leverages the relevant processes, features, and infrastructure already established for existing wire transfer systems. This option may require a new front-end mechanism or new rules that would provide near-real-time confirmation of good funds and timely notification of payments to end users and their financial institutions.**
- b. Linking together existing limited-participation networks so that a sender in one network could make a payment to a receiver in another network seamlessly. This option may require common standards and rules and a centralized directory for routing payments across networks.**
- c. Modifying the ACH to speed up settlement. This option may require a new front-end mechanism or new network rules that would provide near-real-time confirmation of good funds and timely notification of payments to end users and their financial institutions. Payments would be settled periodically during the day.**
- d. Enhancing the debit card networks to enable ubiquitous near-real-time payments.**
- e. Implementing an entirely new payment system with the features described in the second desired outcome above.**

i. **What would be the most effective way for the U.S. payment system to deliver ubiquitous near- real-time payments, including options that are not listed above?**

Enhancing debit card networks to enable ubiquitous near-real-time payments would be the most effective way for the Federal Reserve to reach its stated goals for the U.S. payments system. FIS is already investing in enhancing its debit card network to deliver on a broader set of use cases that is not currently addressed through existing debit card network models. PayNet is a real-time payments network that leverages existing EFT rails and operates under a good funds model to facilitate payments between deposit accounts without the need for card information. PayNet utilizes ABA and account number information to gain direct access to account information at the financial institutions' core processing level in order to provide real-time authorization of good funds. The ABA and account number can be tokenized and authenticated as outlined previously.

ii. **What are the likely pros and cons or costs and benefits of each option? What rule or regulation changes are needed to implement faster payments within existing payment processing channels?**

Described in the table below are the pros and cons associated with each of the potential solutions listed above:

Features	Pros	Cons
<p>a. Creating a separate wire transfer-like system for near-real-time payments that leverages the relevant processes, features, and infrastructure already established for existing wire transfer systems. This option may require a new front-end mechanism or new rules that would provide near-real-time confirmation of good funds and timely notification of payments to end users and their financial institutions.</p>	<p>The most obvious advantage of this approach would be the reuse of an existing ubiquitous single-item, real-time, ABA/account number network, and the avoidance of the expense of creating an entirely new system from scratch.</p>	<p>Gross settlement systems are inherently more expensive to operate than net settlement systems, as they require a larger number of transactions to be processed, additional settlement and reconciliation resources for participants, and also require the counterparty banks to maintain larger reserves to cover their maximum daily exposure.</p> <p>Repurposing the existing wire transfer system would do nothing to reduce these costs. Net settlement, even if it is done multiple times per day, will always be more economical and more suited to retail payments.</p>

Features	Pros	Cons
<p>b. Linking together existing limited-participation networks so that a sender in one network could make a payment to a receiver in another network seamlessly. This option may require common standards and rules and a centralized directory for routing payments across networks.</p>	<p>This option will avoid the expense of creating an entirely new system from scratch and it would preserve the value of industry level investments made in current limited-participation networks.</p>	<p>The need for a common set of standards and rules, as well as a centralized directory, raises issues of market power that will complicate implementation.</p> <p>A centralized directory has the obvious issue of a single source of failure. However, a decentralized or federated solution to routing is a viable solution.</p> <p>An identity system that is secure, efficient, easy to-use, and interoperable will promote “confidence, privacy, choice, and innovation.” With a real-time network there are better ways to ensure a participant is the actual user or is “authenticated” in real-time by the authorized party.</p>
<p>c. Modifying the ACH to speed up settlement. This option may require a new front-end mechanism or new network rules that would provide near-real-time confirmation of good funds and timely notification of payments to end users and their financial institutions. Payments would be settled periodically during the day.</p>	<p>The advantage of this option is the reuse of the existing ABA/account number network. It would avoid the cost of creating a new network from scratch.</p>	<p>The current batch system is negative acknowledgement only:</p> <ul style="list-style-type: none"> • The originator is only notified if the transaction fails, not if it is successfully processed. • Notification is batched, not in real-time. <p>Batch processing will never equate real-time authorizations. Without real-time acknowledgement from the depository financial institution from which funds are debited, risk of accepting ACH batch-type payment for goods and services delivered in a seamless customer experience will always exist.</p> <p>Adding cutover times for batch settlement only increases the amount spent on settlement and reconciliation by participants in the network - costs that will most likely be passed to the end-user in the form of higher fees for banking.</p>

Features	Pros	Cons
d. Enhancing the debit card networks to enable ubiquitous near-real-time payments.	<p>The existing debit card networks currently offer many features of the desired outcomes identified in this discussion, including:</p> <ul style="list-style-type: none"> Existing real-time authorization functionality Existing good funds model Existing rule set framework Existing core processing Interfaces can minimize financial institution investment Existing POS and ATM footprint Message formats that can be modified to carry remittance information for B2B payments 	<p>Without a federal mandate of some sort, some financial institutions may decline to participate for consumers payments, fearing the loss of existing revenues due to substitution.</p> <p>This solution also raises the same questions of common standards and interoperability that linking together limited-participation networks does, although there is much greater standardization in the debit card industry. Industry guidelines can be established by a banking authority like the Federal Reserve to effectively address interoperability and ubiquity.</p>
e. Implementing an entirely new payment system with the features described in the second desired outcome above.	<p>This option will avoid problems of fragmentation, conflicts of interest and reliance on outdated technology.</p>	<p>This solution will take the longest time to bring to market and be more expensive due to a heavy investment in new technology, heavy investment in establishing new rules mutually agreeable to all industry participants and it does not address the questions of ownership and market power. Significant government funding and a mandate would be required to complete this option.</p>

Given the pros and cons above, FIS believes that investment in debit card networks is the optimal alternative. The existing debit card infrastructure provides frameworks that can be leveraged in the near-term to provide a secure, ubiquitous near real-time network. If such a network were to develop through competing service providers, FIS believes that no one provider would capture more than 50 percent of the real-time payments market, and controls could be employed to ensure competitiveness.

iii. Is it sufficient for a solution to be limited to near-real-time authorization and confirmation that good funds are on their way, or must end-user funds availability and/or interbank settlement take place in near-real time as well?

Providing near real-time authorizations to confirm good funds through net settlement is sufficient to achieve the desired outcome described by the Federal Reserve. So long as the network provides adequate means of assuring good funds, there is not a need from a service delivery standpoint for the increased processing, complexity and cost associated with single item, real-time settlement. Because net settlement is between financial institutions, the systemic risk of near-real-time authorizations and good funds with net settlement is essentially limited to the risk of a bank or intermediary failure. While this is not trivial, there are systems in place today that monitor the daylight positions of financial system participants. Introduction of this new network may warrant a re-examination of the adequacy of those systems.

While FIS has explored the option of speeding net settlement by offering multiple windows per day with the new PayNet real-time network, no client has shown interest in such capability due to the increased costs and limited gains associated with multiple settlement windows. While net settlement can occur multiple times per day, multiple settlement windows offer little value and increased processing cost. For the most part, the banks with fewer assets than the top 20 financial institution in the US would be at a huge disadvantage to staff to meet the needs of multiple settlement windows. Especially 24/7 real-time settlement would be operationally cost prohibitive for smaller institutions.

iv. Which payment scenarios are most and least suitable for near real-time payments? (B2B, P2P, P2B, POS, etc.)

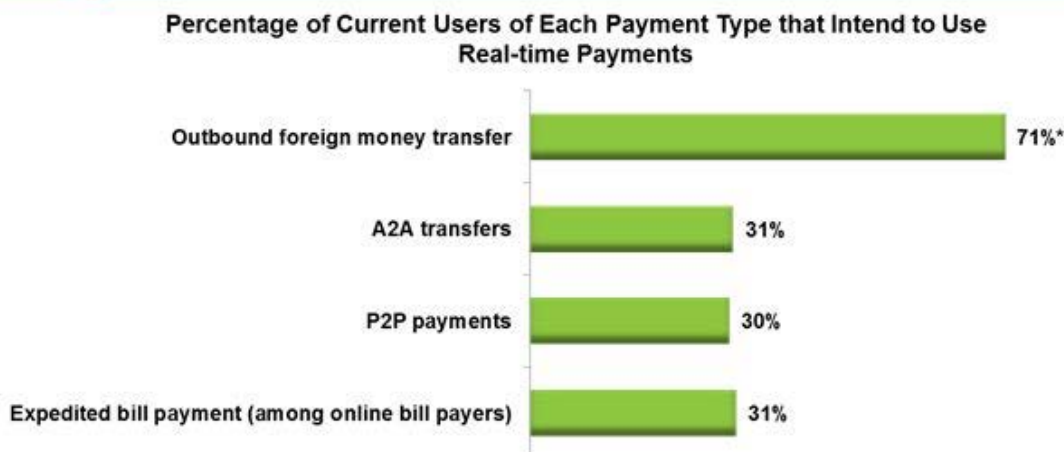
Each of these scenarios can be addressed if existing EFT networks are leveraged to deliver broader applications of payments that already operate with near real-time authorization to ensure a good funds model. Debit card networks already have deep penetration into POS and ATM applications.

However, FIS is investing in a real-time solution that can be leveraged to address each of these scenarios utilizing existing debit network rails. PayNet utilizes ABA and account number information to move good funds between accounts in real-time, broadening the application of traditional card-based networks that rely on PANs, which can be associated with multiple accounts. Furthermore, PayNet is exploring various methods to expand the ISO-based message to include remittance information for B2B and P2B payments.

We believe that a high-demand scenario for real-time payments involves electronic commerce purchases in which the buyer wants to use a debit directly from a checking account. Today, these transactions are processed in the U.S. using ACH, which incorporates all of the risks and delays inherent in that system. Illustrations showing flows of various other applications of a near-real-time payments network including P2P, P2B, A2A, and Cross-border P2P payments are included in the Appendix section.

While there are many consumer- and business-oriented scenarios that are suitable for near-real-time payments, FIS has conducted primary research that demonstrates strong consumer intent to use near-real-time for outbound foreign money transfers, A2A transfers, P2P payments and to expedite bill payments (see chart below). Additional information on this research and the specifics of the usage cases tested with consumers can be found in Q.21.

A SIGNIFICANT PERCENTAGE OF CONSUMERS – ESPECIALLY OUTBOUND REMITTANCE USERS – INTEND TO USE REAL-TIME PAYMENTS



* Read as: 71 percent of overseas money transfer users state they are very or extremely likely to use real-time payments for overseas money transfers
Source: FIS Real-time Payments Survey, March 2013; n = 1,508

Q7. Some industry participants have said that efforts to make check payments easier to use, such as by enabling fully electronic payment orders and/or by speeding up electronic check return information, will incrementally benefit the payment system. Others argue the resources needed to implement these efforts will delay a shift to near-real-time payments, which will ultimately be more beneficial to the payment system. Which of these perspectives do you agree with, and why?

Checks continue to be used persistently for certain types of transactions and we believe this is due to the specific utility value of certain features of checks. Since checks are returned to the maker (or at least an image) with an endorsement, a full record of the transaction is available to the maker, and due to image processing, to the receiver. Additionally, the ubiquity of acceptance and the relatively low cost of processing offer other features that engender their continued use. Specific examples of transactions that make use of these features include business remittance payments, and certain types of person-to-person payments. Child support payments are a good example of an individual maker that wishes to have ready proof of receipt and deposit.

Current check regulations restrict the ways that checks, or check images, can be processed. If the new payments infrastructure were allowed to transport check clearing and return data in real-time, with real-time positive or negative acknowledgement back to the depositing bank, and presumably the depositor, a majority of the current risks represented by delays in determining the status of an item would be reduced almost completely.

Q8. How will near-real-time payments affect fraud issues that exist with today's payment systems, if at all?

Near-real-time payment systems utilize infrastructures similar to other payment systems in which the network has visibility into the transaction throughout its life cycle and its end points (origination and termination), fraud risk can be managed. Near-real-time payment systems will seem attractive to criminal elements because they will provide quicker access to criminal proceeds, reduce the timeframe for discovery, and allow for instant feedback on the success or failure of the fraud activities. Network participants can deploy proactive fraud management applications that can build profiles and prevent/block potentially fraudulent transactions before they are executed. This type of protection will make the fraudster's task more difficult with a higher chance of discovery and failure. Employing prudent anti-fraud controls and procedures will make near-real-time payments less vulnerable and less attractive to potential criminal attacks.

Some ways to reduce and manage fraud risks within payment networks include:

- a. **Network Operating Rules** – Develop rules that push the liability for fraud out to the entity with the closest relationship to the customer, or in the case of a direct originator, the customer themselves. This will require these entities to enforce tight authentication controls to ensure that properly authorized persons are the only ones performing transactions within the payment system.

For example, an Internet retailer should know who its customer is and who is authorized to initiate transactions using that account. The retailer will be liable for fraudulent transactions initiated from that account. The retailer will likely institute the appropriate controls to ensure that only those authorized on the account are able to perform such transactions.
- b. **Strong Authentication** – An authentication process which is secure while not requiring the consumer to alter his/her behaviors will reduce fraud while mitigating consumer adoption hurdles. A variety of methods can be utilized, including device identification, geo-location, tokens, and EMV-like authentication.
- c. **Monitoring** – The payments network infrastructure should allow monitoring of all data points throughout the transaction life cycle including information about who's in the network (participants), what is accessing the network (identification of device and type), and what is being done within the network (types of transactions, what products/services). This information can be processed and analyzed by fraud management applications at the network and participant levels to detect/prevent fraudulent transactions.
- i. **Will near-real-time payments create new fraud risks? If yes, please elaborate on those risks.**

We anticipate that near-real-time payment systems would not create or increase fraud risks that are not already associated with current payment networks. Initially, this new payment system would not garner significant interest by criminals until it reaches a "critical mass" or volume of transactions, value of transactions and diversity and volume of participants (i.e. consumers, merchants, types of products/services). A new payment system presents an opportunity to build sufficient controls within the network infrastructure during its inception.

Q9. To what extent would a ubiquitous near-real-time system bring about pivotal change to mobile payments?

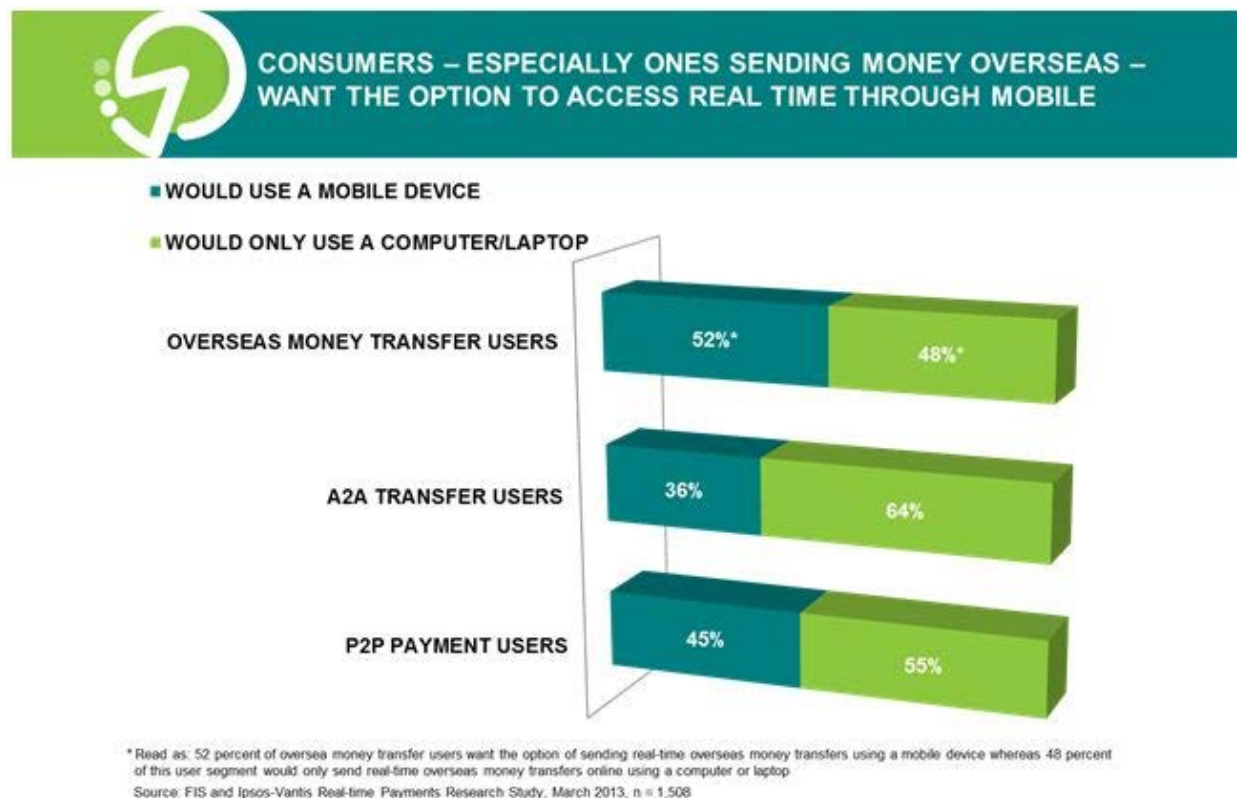
Key obstacles to mass adoption of mobile payments are the lack of "real-time" transactions, universal standards and ubiquity. Currently, consumer adoption of mobile payments is lagging because the consumer does not perceive these transactions as being more valuable versus traditional payment systems.

One key to bringing about pivotal change to mobile payments is developing a payment system that is ubiquitous, faster and safer than current payment options. Providing "cash-like" payment performance from anyone to anyone, anywhere, in real-time, from consumers' mobile devices is functionality that will

make mobile payments a valuable alternative to traditional payment methods. The current closed networks of various alternative payments systems create a significant barrier to wider adoption of mobile payments.

Consumers are more likely to use traditional payment systems than join a variety of payment alternatives. Current mobile payments are no faster and a bit more cumbersome than existing systems from the consumer's perspective. In order to become a preferred method of payment, the "customer experience" of a near-real-time payment system must be more convenient and valuable for the consumer.

While there are certainly customer experience obstacles regarding mobile payments that need to be worked out, FIS' primary consumer research (see additional background in Q.21) finds that many consumers are receptive to the idea of conducting real-time payments with their mobile devices -- especially for outbound foreign remittance users. Fifty-two percent of outbound foreign money transfer users would use their mobile devices for real-time transfers compared to 48 percent who would only use a computer. Forty-five percent of P2P users reported a desire to use their mobile devices to conduct real-time P2P payments compared to fifty-five percent who would only use a computer. And, as one might expect, the research revealed major generational variations in mobile access demand. Seventy-four percent of Gen Y consumers want the ability to conduct real-time P2P payments using their mobile phones and nearly half of the Gen X and younger boomer segments also want this capability.



Q10. What would be the implication if the industry and/or the Federal Reserve Banks do not take any action to implement faster payments?

- a. Reduced competitiveness for U.S. companies and banks versus peers in other countries due to higher working capital requirements and higher payment processing costs.
- b. Slower progress toward bank-based cross-border payments.
- c. Increased difficulty in complying with disclosure requirements for remittances.
- d. Increased fraud losses as non-banks implement solutions that bypass or interfere with existing fraud mitigation strategies embedded in legacy payment systems. For example, using digital wallets as a front end for a credit or debit card deprives card issuers of necessary data, such as merchant ID and transaction velocity, to manage fraud risk. This phenomenon has not yet manifested due to the low transaction volumes through digital wallets, but will become a serious problem when the volumes rise to the point where they attract criminal interest.

i. What is the cost, including the opportunity cost, of not implementing faster payments in the United States?

If the U.S. does not invest in updating its payments systems for near-real-time payments, its global competitive edge will continue to erode. The global trend towards real-time payment systems will continue, leaving the U.S. behind the rest of the world, and comparably inefficient.

Over time, the inefficiencies of the current system will manifest itself in the form of price increases for U.S. consumers and potential missed opportunities for U.S. job creation. Without a real-time payments system, the cost of doing business in the U.S. will increase relative to the rest of the world, making the U.S. a less favorable market. Given a higher relative cost of doing business, corporations may opt not to do business in the U.S., which would also imply a potential loss of jobs that otherwise could have been created within the U.S.

FIS has invested to modernize the ability of banks of all sizes to accept near-real-time payments. FIS is investing in modernizing its core processing systems to leverage the existing EFT “rails,” an approach that aligns to the action taken in the U.K. with faster payments and other near-real-time systems around the globe. Existing EFT systems provide a robust online, real-time infrastructure to provide near-real-time authorizations, online communication, and fraud prevention, and leveraging this existing infrastructure minimizes the investment required to make real-time payments a near-term reality.

Q11. To what extent will the industry need to modernize core processing and other backend systems to support near-real-time payments?

i. What is the likely timeframe for any such modernization?

FIS has invested ahead of the curve by preparing all FIS platforms to connect with the PayNet near-real-time payments network in 2014. Furthermore, FIS is in negotiations with other leading core processing providers and EFT processors to provide a similar real-time payments integration in their core processing solutions.

By leveraging the existing EFT infrastructure, PayNet minimizes a financial institution’s required investment for delivering secure, regulated FI-centric payment functionality. Based on experience implementing PayNet for our clients, FIS estimates that, depending on the size of the financial institution and their current systems and processes, the development and implementation hours for a single financial institution range from 50 to 5,000 hours. The upper-end of this range applies only to the largest financial institutions that have complex in-house EFT and core accounting systems, while the lower-end of the range applies to the majority of financial institutions that outsource these systems to a processor like FIS.

To summarize, FIS has already made extensive infrastructure investments to get the PayNet network operating and processing payments in a production mode today. The software required to provide standard interfaces to other FIS core products will be commercially available in 2014, and we anticipate that similar products from other financial services technology providers will be available beginning in 2014 and into 2015.

Q12. Some industry participants suggest that a new, centralized directory containing account numbers and routing information for businesses and/or consumers, to which every bank and other service providers are linked, will enable more electronic payments. A sender using this directory would not need to know the account or routing information of the receiver.

i. What are the merits and drawbacks of this suggestion?

a. Merits:

- Network interoperability
- Reduced financial institution switching costs
- Improved ability to change account details if compromised without disrupting ongoing commerce

b. Drawbacks:

- Conflicts of interest on the part of the entity(ies) charged with operating the directory
- Single point of failure
- Highly attractive target for attack

ii. What is the feasibility of this suggestion?

- a. The feasibility of this suggestion would be improved by using a federated model, where a limited set of data is shared between multiple directory operators, and all other data remains proprietary to individual payment schemes or operators, thus allowing for market-based pricing of data exchange. The freely shared data would be limited to a token, defined as an alphanumeric string that is linked to a single payment instruction, including payer account, payee account, amount, value date, and rule set. Other tokens containing proprietary data could be linked to the shared token to support value-added services such as reward and loyalty programs, fraud management, and economic analysis. Our comments in Q5.i above may also be pertinent here.
- b. Such a system would need to account for differing account numbering standards, perhaps necessitating a national account numbering system. Otherwise, there may be confusion between different accounts.
- c. While such a directory system may offer a means of reducing the friction in electronic commerce and accelerating adoption, FIS believes that deployment of such a solution can be managed along a separate track from the implementation of a near-real-time, non-card, good funds payments system.

Electronification

Q13. Some industry participants say that check use is an enduring part of the U.S. payment system and that moving away from checks more aggressively would be too disruptive for certain end users.

i. Is accelerated migration from checks to electronic payment methods a high-priority desired outcome for the U.S. payment system? (Accelerated means faster than the current trend of gradual migration.)

No, in our view it is not a “high” priority desired outcome.

ii. Please explain, if desired.

Checks are almost completely electronic now after they reach the bank for first deposit. Most of the cost savings have already been realized, and the cost of accelerating migration from checks to electronic payment methods is likely to exceed the savings. Also, as demonstrated by the experience of the U.K. government, checks are politically sensitive, because they are a high priority for an influential segment of the population. A more effective approach may be to enable check images to be cleared through the real-time, good funds network being considered here, and to establish a standard for electronic exchange of remittance data, since these are the main obstacles for businesses migrating to electronic payment methods.

iii. If yes, should the Federal Reserve Banks establish a target for the percent of noncash payments to be initiated via electronic means, by a specific date? For example: "By the year 2018, 95% of all noncash payments will be made via electronic means."

iv. What is the appropriate target level and date?

Q14. Business-to-business payments have remained largely paper-based due to difficulties with handling remittance information. Consumer bill payments also are heavily paper-based due to the lack of comfort some consumers have with electronic alternatives. In addition, many small businesses have not adopted ACH for recurring payments due to technical challenges and/or cost constraints. The payment industry has multiple efforts underway to address these issues.

i. To what extent are these efforts resulting in migration from checks to other payment types?

FIS believes that there are certain utility features of checks that support their continued use in the marketplace, particularly in the areas highlighted in this question.

Ubiquitous acceptance and a complete record of the receipt and processing of the transaction by the payee are features of checks that appeal to businesses in addition to the flexibility to attach other information such as remittance information to the payment. While ACH offers ubiquity, it does not provide a ready record of the transaction, and successfully transmitting additional information requires pre-arrangement between the parties and their financial institutions.

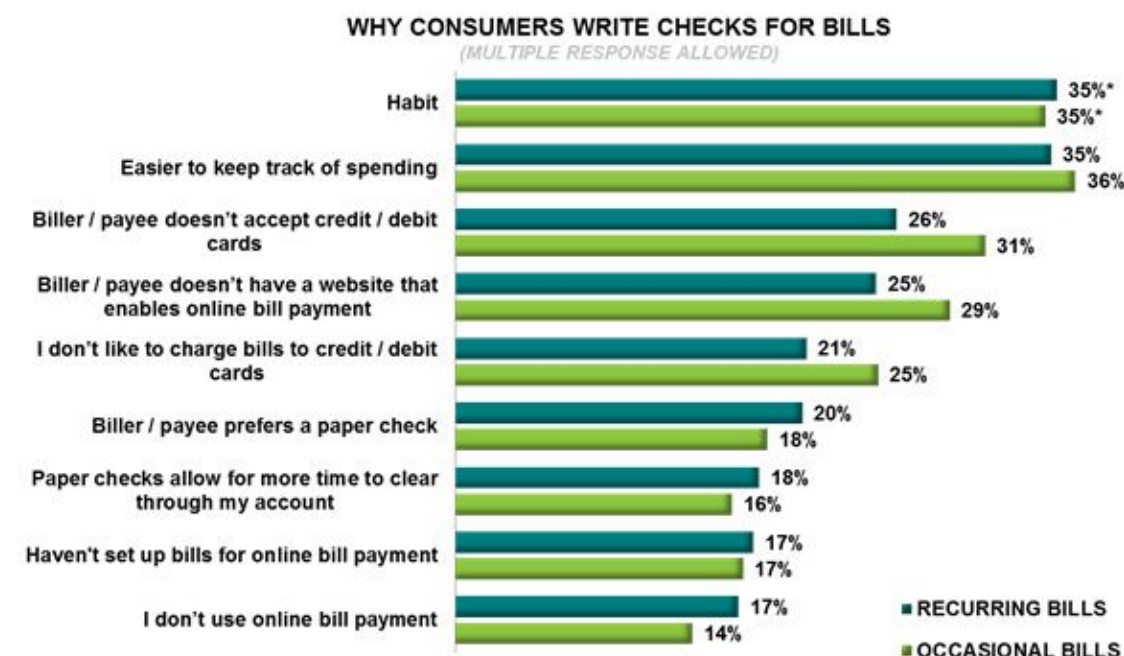
In a similar fashion, consumers continue to write checks because of the features of ubiquitous acceptance, and in many cases because of a cost differential when attempting a card based transaction in the form of a convenience fee.

A well-constructed network infrastructure, such as PayNet, will offer features to meet these needs, and will reduce the barriers to switching from checks.

Some of FIS' views on this topic are covered in our response to Q7, so please refer to that discussion as well.

ii. What other barriers need to be addressed to accelerate migration of these payments?

Ubiquitous acceptance, low and understandable costs, the ability to provide immediate and easy confirmation of receipt and processing, and the ability to carry information payloads without pre-arrangement are the features that continue to sustain the demand for checks. If a new payments infrastructure like PayNet addresses these needs, FIS believes that check volumes will decline at an accelerating rate, based on the research results presented below.

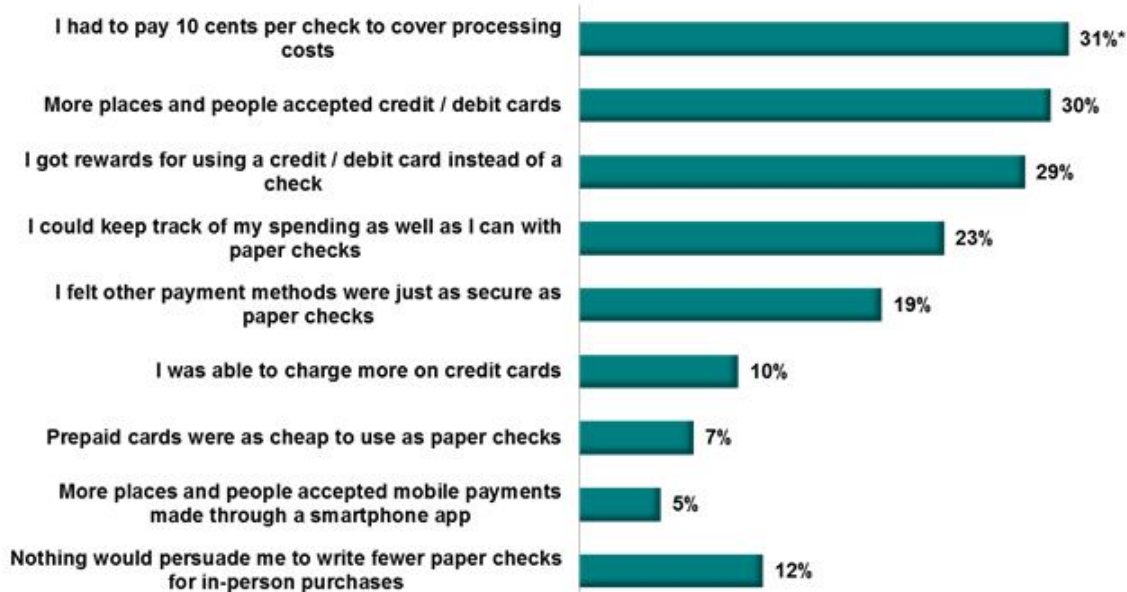


* Read as: Among consumers who use papers checks to pay recurring or occasional bills, 35 percent stated that habit is a key reason for their continued check usage
Source: FIS Consumer Payments Preferences Study, February 2012, n = 3,204



MOST CONSUMERS COULD BE MOTIVATED TO WRITE FEWER CHECKS FOR IN-PERSON PURCHASES

AGREEMENT THAT THEY WOULD WRITE FEWER CHECKS IF... (MULTIPLE RESPONSE ALLOWED)



* Read as: 31% of paper check writers would use fewer paper checks if they had to pay 10 cents to cover processing costs
Source: FIS Consumer Payments Preferences Study, February 2012, n = 3,204

iii. What other tactics, including incentives, will effectively persuade businesses and consumers to migrate to electronic payments?

FIS believes that the market will be effective in moving check transactions to other vehicles in an orderly fashion without overly aggressive tactics. Additionally, the experience of The Payments Council in the U.K. provides a cautionary tale of the risks in being overly aggressive in the regulatory elimination of checks.

iv. Which industry bodies should be responsible for developing and/or implementing these tactics?

FIS believes that the check industry is winding down in an orderly manner and extraordinary tactics are not required.

Cross-border Payments

Q15. To what extent would the broader adoption of the XML-based ISO 20022 payment message standards in the United States facilitate electronification of business payments and/or cross-border payments?

There are many barriers to creating an effective real-time cross border payments network, including regulatory, legal and privacy issues, data sovereignty issues and ownership or stakeholder issues. Notwithstanding all of this, establishing a global standard for communication is important as cross-border transactions increase in a more globally connected economy. Standard means of communication as offered by ISO 20022 will help provide a common language to help foster business relationships in the long term. Because ISO 20022 has the ability to include remittance information in a payment message, adoption of this standard would facilitate electronification of business and cross-border payments. Adoption of the ISO20022 standard as the foundation of a new network infrastructure will confirm its validity as a global standard and avoid the need for later migration.

Q16. What strategies and tactics do you think will help move the industry toward desired outcome four - consumers and businesses have greater choice in making convenient, cost-effective, and timely cross- border payments?

Section 1073 of the Dodd-Frank Wall Street Reform and Consumer Protection Act set the stage for future competition in the cross-border remittance market. The provisions of Section 1073 create a level playing field for all remittance transfer providers, regardless of whether such provider is a financial institution, Money Transfer Organization (MTO), or something else (broker-dealers). In the short run, however, it has had the effect in the marketplace of driving smaller financial institutions out of the cross-border remittance business and increasing the business of MTOs, since effective bank-centric solutions have been lacking in the marketplace.

In contrast to domestic real-time funds transfer, where substantial support from the government may be necessary to ensure progress, FIS believes that the private sector is making sufficient progress on its own in cross-border payments, and that the main role of government should be to reduce the friction caused by conflicting national regulations and standards.

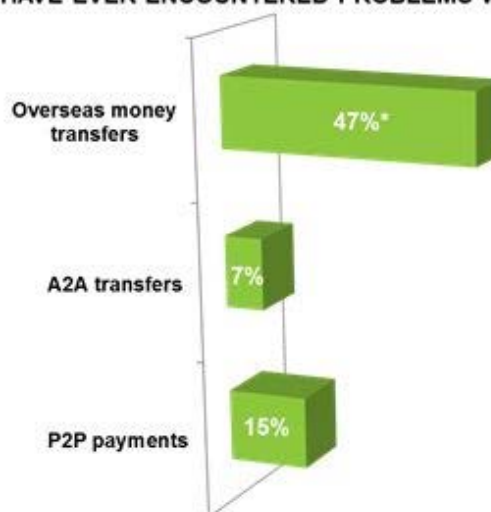
As noted in Q21 of this document, FIS consumer research reveals high levels of interest in real-time, cross-border payments. A key driver of this interest stems from problems occurring in the money transfer process. The FIS research asked users of overseas money transfers, A2A transfers and P2P payments about what problems they have encountered with these processes. While relatively small percentages of users of A2A transfers and P2P payments reported past problems, nearly half of people sending money overseas have encountered difficulties with money transfers.



OVERSEAS MONEY TRANSFER USERS EXPERIENCE MORE PROBLEMS WITH PAYMENTS

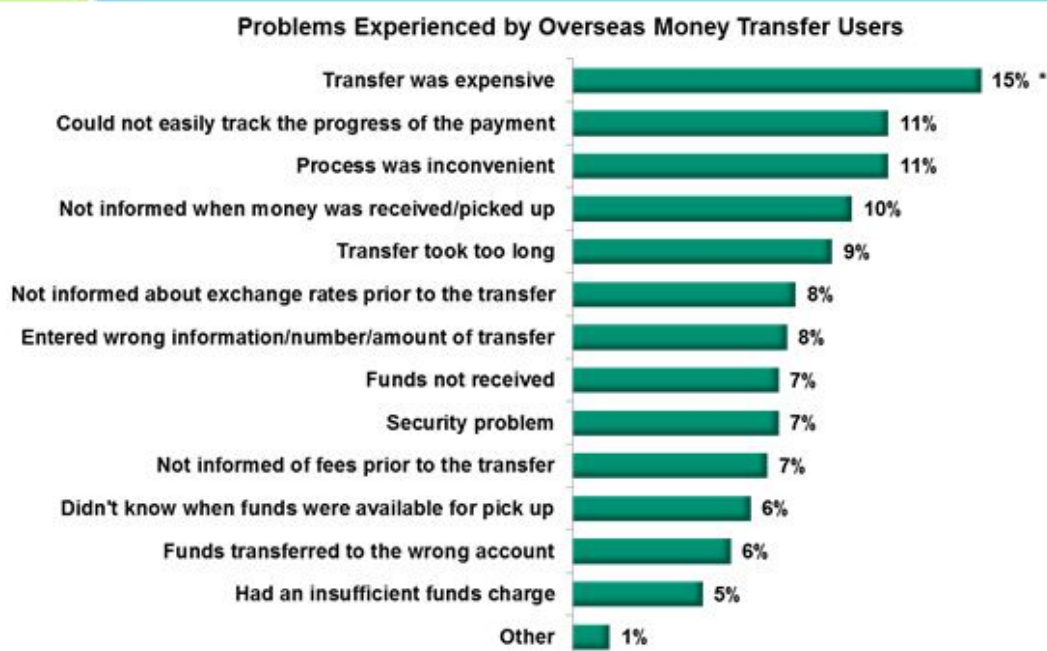
- **Overseas money transfer users have more pain points:**
 - Perceived high cost
 - Slow
 - Inconvenient
 - Lack of transparency
- Cannot easily track progress
- Not informed of pick up
- Not informed about exchange rates prior to the transfer

HAVE EVER ENCOUNTERED PROBLEMS WITH...



* Read as: 47 percent of overseas money transfer users have encountered problems with their transfers.
Source: FIS and Ipsos-Vantiv Real-time Payments Research Study, March 2013, n = 1,508

After perceived high expense, common problems cited by consumers often involve issues emanating from lack of transparency in the process, inconvenience and/or slowness of the transfer. These multiple points of friction in making outbound foreign money transfers present opportunities for financial institutions to simplify the process and offer significant value to customers. As succinctly reported by one of the consumers who participated in our research, *“It takes anywhere from two to five days. It leaves your account but doesn’t get to theirs. Sometimes it’s like a black hole.”*



* Read as: 15 percent of overseas money transfer users cite “transfer was expensive” as a problem
Source: FIS and Ipsos-Vantis Real-time Payments Research Study, March 2013, n = 1,508

Safety

Q17. Payment security encompasses a broad range of issues including authentication of the parties involved in the transaction, the security of payment databases, the security of software and devices used by end users to access payment systems, and security of the infrastructure carrying payment messages.

- i. **Among the issues listed above, or others, what are the key threats to payment system security today and in the future?**
 - a. **Authentication** – Authentication of the parties involved in the transaction is a critical factor in providing safety as well as consumer confidence in a payments system. Development of an authentication process that does not require the consumer to alter his/her behavior is the key to facilitating adoption of the payment system.

- b. **Security of payment, credential databases** – The storage of payment and credential data must be secure. This is an area of great interest to criminals. The information contained in these databases are the “keys to the kingdom” for anyone trying to create fraudulent transactions and access funds. Additionally, this information can be used outside the payment system for other nefarious purposes. It is critical that the payment system develop security standards for all participants. Originators, receivers, processors and financial institutions all have a responsibility to ensure that the data they maintain is safe from compromise. When a data compromise occurs, the response must meet standards required by the payment system. Participants that do not comply with security standards should be held accountable by the network, and the network must have adequate monitoring, detection and enforcement capabilities to ensure compliance. Failure to comply with the network’s standards undermines the confidence in the payment system.
- c. **Security of software** – A primary key to security is developing standards for all software accessing the payment system. The diversity of mobile operating systems (i.e. iOS, Android, Windows, etc.) makes standardization challenging. Software used to access payment systems must meet security standards set and managed by the payments network. Software should meet testing and certification requirements set by the payments network. Software not meeting standards should be de-certified and its access to the payment system denied.
- d. **Security of devices** – Standards must be developed by the payment network regarding device access to the network. With smartphone technology advancing rapidly, the network can use a number of tools to monitor and authenticate devices. Geo-location can be used to determine if the location of the device is consistent with the location of the transaction initiation. Devices of all types, especially mobile devices, contain unique identifiers that can be used as part of the authentication process as well.
- e. **Customer credentials** – Customers tend not to exercise the greatest care to protect their passwords, PINs and personal data on their computers and mobile devices. If credentials are stolen, it is likely the customer has similar credentials for similar devices and/or applications. The development of security protocols for customer authentication accessing the payments network must be developed to reduce the threat without requiring changes in consumer behavior.

ii. Which of these threats are not adequately being addressed?

The problem is less about whether the threats are being adequately addressed than it is the lack of a consistent, unified payment policy that can maximize reuse of risk management resources, enhance information sharing, and prevent loss of data during the handoff of a transaction between two processors.

iii. What operational or technology changes could be implemented to further mitigate cyber threats?

Aside from the challenges described above, the development of a centralized, secured clearinghouse of known cyber threats, possible defenses and “best practices” could be useful to members of the network. Access to this database should be strictly controlled to avoid compromising sources and methods and prevent misuse of the data.

An alert notification process that would notify members of current threats would also be helpful.

As outlined above in Q4.i, there is a need for a cloud-based Identity & Privacy Services which defines the liability responsibilities while ensuring that operational, legal, and security obligations are met. An Identity system that is secure, efficient, easy to-use, and interoperable will promote “confidence, privacy, choice, and innovation”. With a real-time network there are better ways to ensure a participant is the actual user or is “authenticated” in real-time by the authorized party.

Q18. What type of information on threat awareness and incident response activities would be useful for the industry?

A centralized clearinghouse, available to members, of information and intelligence would be useful to the industry if it contained information such as:

- Known cyber threats (past and present)
- Monthly updates or newsletters including examples of threats, responses and best practices
- Threat alert processes to inform members of immediate threats
- Threat assessments - notice of intelligence indicating potential threats and vulnerabilities
- Reporting capabilities for members to report and share information

i. How should this information be made available?

Members should be able to obtain this information by a variety of methods, including:

- Secure e-mail subscriptions
- Real-time access to the database by members
- Broadcast warnings of serious threats, outages, etc.

Q19. What future payment standards would materially improve payment security?

Payment standards for non-card based systems will need to provide security similar to the EMV standards that the card payment systems are adopting. Such a security feature will enable financial institutions and other payment processing or solution providers to secure their payment solutions. This technology will enhance security and integrity using proprietary account identification token and transaction authentication services for mobile payments. Transaction authentication services leverage in-place assets already required for EMV authentication of card payments thereby enhancing the return on investment for these expenditures.

An account identification token enhances the security and integrity of account ownership decisions. Transaction authentication services enhance the security of non-card payment transactions by applying EMV like cryptography to non-card payment transactions.

i. What are the obstacles to the adoption of security-related payment standards?

- a. **Costs** – Financial institutions, merchants and processors will make decisions based on the amount of investment (cost) to implement standards versus the expected revenue increases and fraud reduction as a result of participation in a payment system (benefit). If the standards require too substantial of an investment versus existing payment system's standards and their view of near-real-time payments is not enthusiastically favorable, participants may be reluctant to participate.
- b. **Technology** – With the rapid advances in technology, participants may be hesitant and/or unable to allocate sufficient resources to develop new security applications for a new payment system. Although participants may feel the need to invest in such security application on their own, the financial technology sector can bring expertise, efficiency and scale to security solutions as well.
- c. **The "user experience"** – The challenge of security is to provide protection without causing negative impacts to the consumer's experience. It is a delicate balance to provide the security and safety that the consumer wants without causing the consumer to perform additional tasks.

Q20. What collaborative actions should the Federal Reserve Banks take with the industry to promote the security of the payment system from end to end?

With the Federal Reserve Banks acting as a partner with the various stakeholders in the development of a near-real-time payment system, the development of the following will promote security:

- Operating and interoperability standards – The Federal Reserve can take a leadership role in the development of standards that will ensure interoperability and consistency between multiple near-real-time payment systems. The adoption of the ISO 20022 standard, discussed in Q15 above would be an effective means of taking that leadership position.
- Centralized clearinghouse – Assist in the development of a threat clearinghouse that would facilitate sharing of information among payment systems participants/members. Types of information that might be shared include:
 - Potential threats, best practices
 - Blacklisted devices – develop a database of lost/stolen devices in cooperation with mobile providers
 - Known suspects (i.e. persons, devices, IP addresses, etc.)
- Assist in the development of a set of industry standards and best practices for security at each participant level.

Q21. Please share any additional perspectives on U.S. payment system improvements.

FIS Research on Real-time Payments

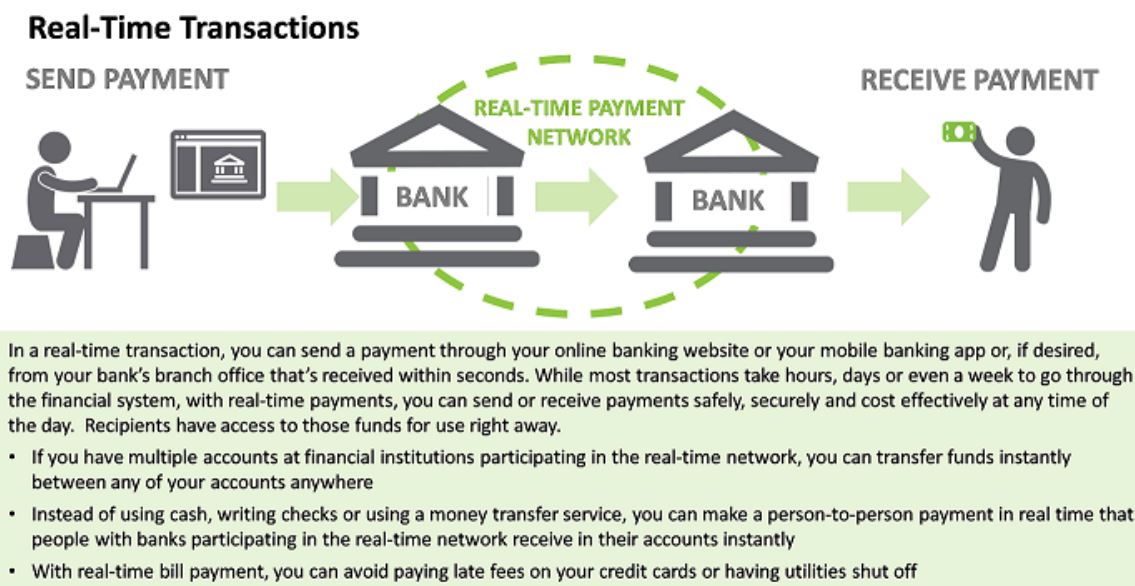
On several occasions the FIS response to the Payment System Improvement – Public Consultation Paper cites results of primary research. This research was conducted by FIS to assess consumers' receptivity to real-time payments in general and adoption potential for specific usage cases.

In addition to the executive summary of research findings that follows, FIS' response to the Public Consultation Paper includes three research reports that were published in 2013:

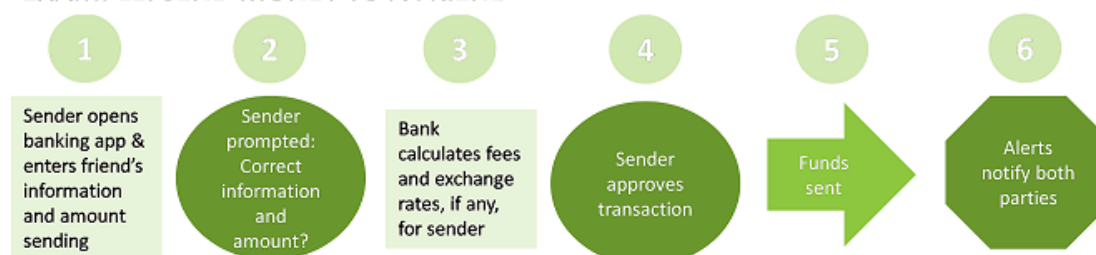
- Real-time Payments Resonate with Consumers (April 2013)
- Real-time Payments Hold Economic Value (May 2013)
- PayNet Network from FIS: The Real-time Payments Network for the Real World (November 2013).

Research Executive Summary

A visual of the overall real-time payments concept that was tested with consumers is attached below. Note that our research was oriented toward testing consumer receptivity of receiving real-time payments through the online or mobile banking services of their primary financial institution (i.e., the primary checking account provider).



EXAMPLE: SEND MONEY TO A FRIEND



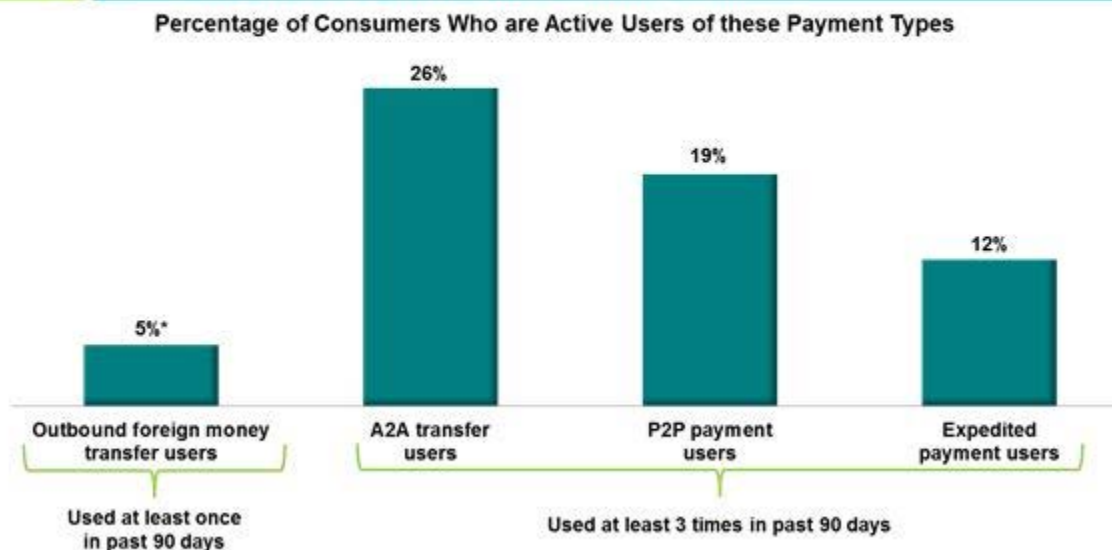
In conducting the research, FIS sought to understand the problems that real-time payments can solve for consumers, determine perceived value of real-time payments and investigate how real-time payments will likely affect consumer choice in payments. Key details of the research methodology include:

- The research included a qualitative study (four consumer focus groups held in February 2013) to guide quantitative research design.
- The quantitative research was conducted through an online survey in March 2013 of 1,508 adults who qualified for one of five different usage case segments, four of which are described below.
- The focus groups and quantitative survey were conducted with the assistance of Ipsos Vantis, a global leader in financial services innovation research.
- The visuals used in the quantitative survey to portray the four usage cases are included in the Appendix to this document.
- Individuals were qualified on the basis of being a primary household financial services decision maker and by having at least a checking account and being active users of online or mobile banking services with that checking account (active defined as use within the past 30 days).

- More than 300 completed consumer surveys were gathered for each of the four usage case segments. The fifth usage case segment included online shoppers, which is not included in our response.

The real-time payments applications described in this response, as well as the definitions used to qualify individuals for answering questions about the specific use cases, include:

- **Outbound foreign money transfer users** — 5 percent of adult financial decision makers: Sent money to other individuals or to their own accounts outside of the U.S. at least once in the past 90-days.
- **A2A transfer users** — 26 percent of adult financial decision makers: Transferred funds online at least three times in the past 90 days between their own accounts at different institutions or transferred funds online between their own accounts at the same institution that involved more than just transferring money between checking and savings accounts.
- **P2P payment users** — 19 percent of adult financial decision makers: Paid individual people in person or sent money to other individuals within the U.S. at least three times in the past 90 days using any type of payment method (e.g., cash, checks, electronic money transfers).
- **Expedited payment users** — 12 percent of adult financial decision makers: Made at least one expedited payment in the past 90 days. Respondents who were exposed to the real-time (expedited) bill payment concept represented a much broader target defined as: Paid bills using your checking account provider's online bill pay service, at the biller's website or through a third party online bill payment service at least three times in the past 90 days.



* Read as: 5 percent of U.S. adults who make household financial decision have made an outbound foreign money transfer in the past 3 months
Source: FIS and Ipsos-Ventis Real-time Payments Research Study, March 2013; n = 1,506

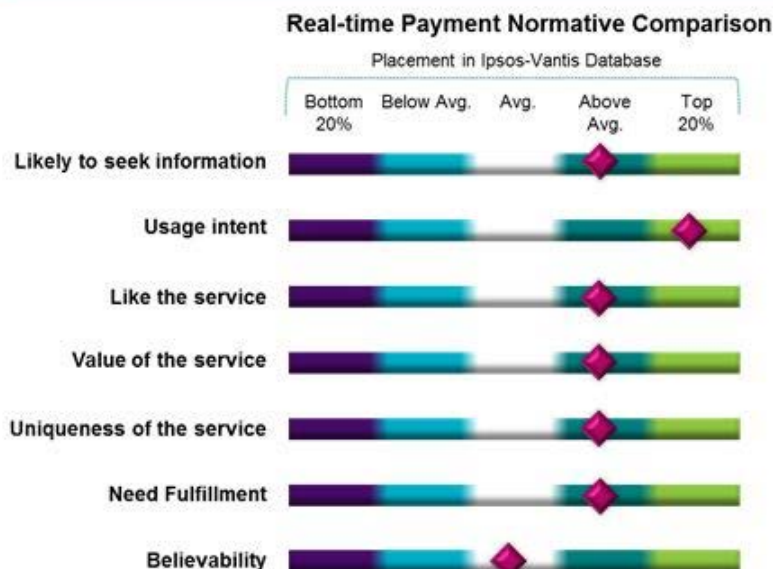
Faster Really is Better

A key problem with payments today is they often don't work as fast as consumers and the global economy demand. With the advancing sophistication of technology, consumers want and expect real-time experiences and instant gratification. In certain contexts, the movement of money has not kept up. Payments, either too slow or too costly, are late comers to the real-time revolution.

Meanwhile, financial institutions are under relentless pressure to satisfy customers across more channels, expand transaction volumes, create new revenue streams and forge deeper relationships. The prospect of faster or "real-time" payments offers financial institutions enticing opportunities to achieve the transaction velocity consumers desire as part of a differentiated banking experience. However, it is difficult for a financial institution to know how and where to start as little is known about the true potential for real-time payments in the U.S.

FIS specifically selected our research partner for this project, Ipsos Vantis, because they have a proven methodology for helping firms understand and forecast demand for new, technology-based consumer services. Ipsos Vantis has utilized this methodology to test over 28,000 new consumer service concepts, including more than 5,000 cases in financial services, and has the world's largest database of key measure survey scores on these tests.

The FIS research posed a series of questions about the real-time payment concepts to measure interest, intent to use, likeability, perceived value, uniqueness, needs fulfillment and believability. The real-time payments concepts tested exceeded Ipsos Vantis norms on all of these measures except for believability, which received an average score, and received the highest Ipsos Vantis rating possible on usage intent. In short, consumers understand the value propositions underlying real-time payments and demonstrate strong likelihood to use the service.



Source: FIS and Ipsos-Vantis Real-time Payments Research Study, March 2013, n = 1,508

The FIS research asked consumers out of their last 10 transactions of a specific type (i.e., outbound remittance, expedited bill pay, A2A or P2P) how many they would use real-time through their primary financial institution's online banking service or mobile banking application. Consumers are likely to convert meaningful percentages of their existing transactions to real-time payment services (see below).



Among active users of these services, the average percent of transactions users would like to convert to real time through online/mobile banking



* Read as: Expedited bill payment users estimate they would shift 71 percent of their expedited bill payments, on average, to a real-time payment service offered through their financial institution's online/mobile banking service

Source: FIS and Ipsos-Ventis Real-time Payments Research Study, March 2013, n = 1,500

Consumers Trust their Financial Institutions to Bring Them Real-Time

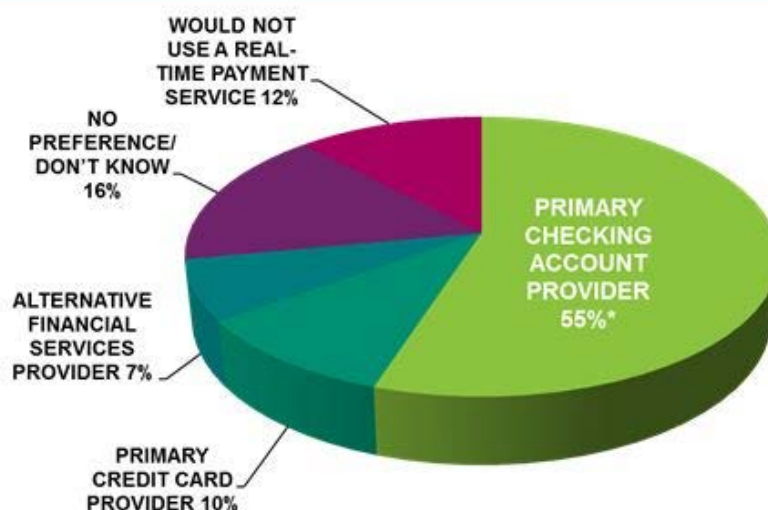
The FIS research also took the pulse of individuals to determine how real-time payments could affect their relationships with their financial providers. The majority of consumers agreed that real-time payments are a safe and secure way to send money and that real-time would make their banking more convenient.

Fifty-five percent of those surveyed prefer to get real-time payment services from their primary financial institution rather than a credit card or alternative payment provider. In our research, the primary financial institution is defined as the firm that holds the primary checking account relationship. Only 12 percent of consumers expressed no desire to use a real-time payment service.

During consumer focus groups, we found that some people trusted their financial institution more for providing real-time payments because they had experienced problems with alternative payment providers, while others perceived they could more easily hold their financial institutions accountable if problems occurred. A couple pertinent quotes captured from consumers during the research reflect this.

"I'm fairly adamant that I want to go through the bank. I have more trust in the banks."

"I would choose the bank for safety reasons."



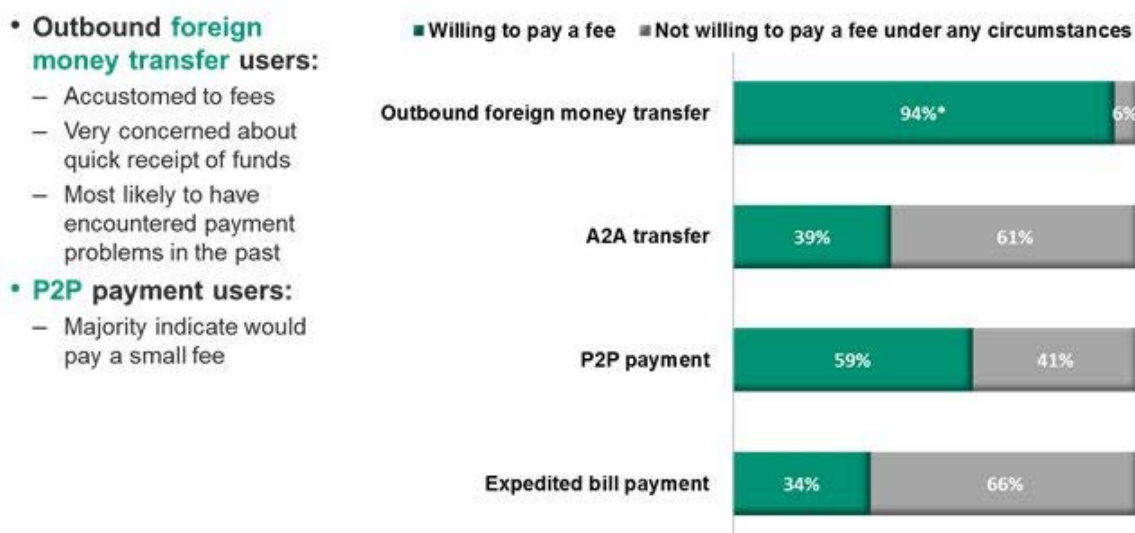
* Read as: 55 percent of the sample prefers to get real-time payment services from their primary checking account provider
Source: FIS and Ipsos-Ventis Real-time Payments Research Study, March 2013, n = 1,508

Many Consumers Will Pay for the Convenience of Real-Time

Although consumers often initially react favorably to a new concept in research studies — even one with which they have no familiarity other than a concept statement — some indicate less enthusiasm toward adoption when exposed to pricing scenarios.

In focus groups, consumers across age and income cohorts told us they expect that their financial institutions will charge fees for real-time payments. There is a built-in consumer expectation of a real-time paradigm. Consumers clearly understand real-time payments' value proposition of convenience and faster transaction speed. Survey results show that many consumers are willing to pay for real-time transactions but, as a whole, two segments are much more willing to pay than the other two:

- Because most outbound foreign money transfer users are accustomed to paying fees and many of them are concerned about their recipients having quick access to funds, the lion's share — 94-percent — will pay a fee to the financial institution for real-time payments (see chart below).
- Although the majority of A2A transfer users and online bill payers (who responded to the expedited bill payment concept) would not pay for real-time for those use cases, the majority of P2P real-time payment users would pay some small amount for the service (see chart below).



* Read as: 94 percent of outbound foreign money transfer users are willing to pay a fee for real-time payments
Source: FIS and Ipsos-Vantiv Real-time Payments Research Study, March 2013, n = 1,508

Bankers Agree that Real-Time is a Real Opportunity

The stage is set for real-time payments. Consumer demand is tangible. Consumers prefer to receive real-time payments services from their primary checking account provider over alternative financial services providers by a three-to-one margin. Financial institutions have an opportunity to educate consumers on the benefits of real-time payments and to drive transaction volume and fee revenue within payment systems that banking providers' control.

Broadly speaking, banking executives agree. Concurrently conducted with the consumer research, FIS engaged Phoenix Marketing International to conduct executive interviews with 32 bankers based within the U.S. and found that interest in faster, more-efficient payment systems is on the rise overall. Most of those interviewed believe that various real-time payment applications will be a competitive necessity in key markets within the next few years. But understanding the business case and which real-time payment services will experience higher demand than others is critical. Bankers generally believe that there will be two main segments of consumer demand:

- Younger adults – due to their propensity to embrace new offerings more rapidly than others.
- The affluent – due to an above-average tendency to transact more often with higher volumes, across accounts and institutions.

The FIS consumer research confirms that these two customer sets will be the early adoptions as real-time payment services reach the marketplace.

Additional key findings from the interviews with the 32 bankers are highlighted in the table below:

How real-time payments are viewed by bankers	
State of Demand	<ul style="list-style-type: none"> • Interest in faster, more efficient payment options are on the rise overall. Bankers expressed demand for better performance and less appetite to wait. • Bankers conveyed solid overall interest in real-time payments. The average level of interest was 7.5 on a 10-point scale. • However, bankers believed the path to real-time payments will not be simple or straightforward. A diverse set of bank and non-bank stakeholders manage various roles in transactions and banks see themselves with restricted ability to control or influence parts and steps of a given transaction.
Market Needs	<ul style="list-style-type: none"> • Bankers stated that real-time is not an immediate need for most current transactions. However, they clearly foresee that real-time options can add value but under specific situations -- e.g., emergency transfers to family member, last-minute bill payments. • Smaller banks tended to be most interested in consumer applications -- P2P, bill payment, A2A transfers. • Larger banks were attracted to consumer payment opportunities, but also expressed interest in applications that (1) enable account-to-account transfers within their own bank or to other institutions, and (2) opportunities to serve corporate customers with international money transfers. Some mentioned opportunities to help small businesses enter new markets (e.g., international) and better predict cash flow. • When asked to estimate the portion of their customer bases that would likely adopt real-time payment solutions, the bankers' estimates ranged from 5 percent to 30 percent.

Opportunity Areas	<ul style="list-style-type: none"> • Fee generation from access to the DDA to validate balances and transactions was deemed the most likely to drive revenue for banks and was especially well-received by banks with significant retail operations. Fees for real-time transfers were viewed as “not too massive” but likely to have enough volume and margin to drive interest. • Most bankers (about two-thirds) were enthusiastic about the opportunity to leverage real-time payment applications in new payments offerings, such as mobile wallet and expedited payments. • The topic of fraud is both a risk and an opportunity. Bankers believe the immediate settlement of real-time transactions (and their finality) presents security threats that must be carefully managed. However, while admitting that risk models and fraud prevention measures need to evolve in response to real-time, many bankers were confident they already have strong fraud management measures. Bankers overwhelmingly viewed fraud control via the ability to validate accounts and balances as the area with the strongest impact on cost reduction.
Business Case Drivers	<p>Bankers cited a number of requirements for real-time payments to gain acceptance, including:</p> <ul style="list-style-type: none"> • Strong evidence of network breadth and reliability, with a plan to attain ubiquity (every account in the country is the desired end state). • Highly relevant use cases to target customers. • Assurances of compliance with regulations. • A relevant and comprehensive business case, highlighting the expectations to drive market impact and incremental financial performance. • Confidence that implementing such new solutions can be achieved with reasonable effort and not conflict too significantly with what banks do now. The impacts on legacy systems and how the entire payment function is managed within a bank are key areas of concern (e.g., authorization, validation, settlement processes). • Required maintenance the overall stability of payments ecosystem.

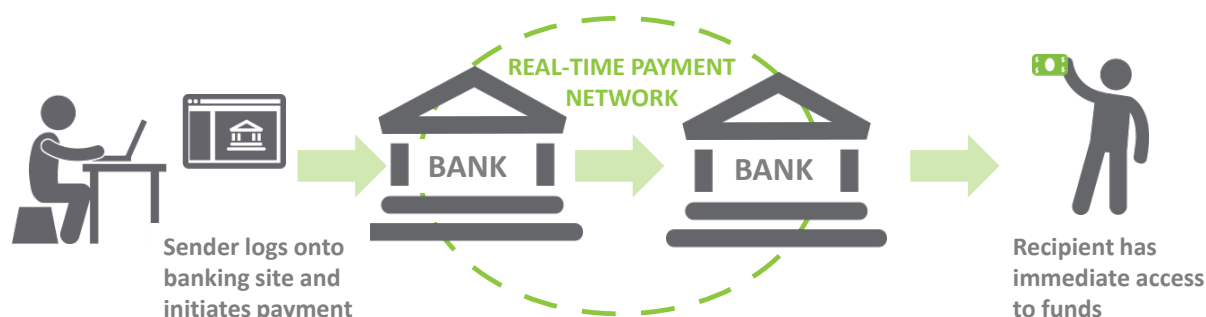
Appendix

Visuals used in the FIS quantitative survey to portray the four real-time payment usage cases.

Person-to-person transfers

With person-to-person (P2P) real-time transactions you can settle a debt with another person on the spot or send money to a person at any time and your recipient can access the money immediately. Payments can be made safely and securely through online banking or mobile banking apps. Examples of common P2P transactions include: paying household help, babysitters and other individuals who provide services; paying back a roommate for shared expenses; reimbursing a friend; sending money to a relative as a gift or for an emergency.

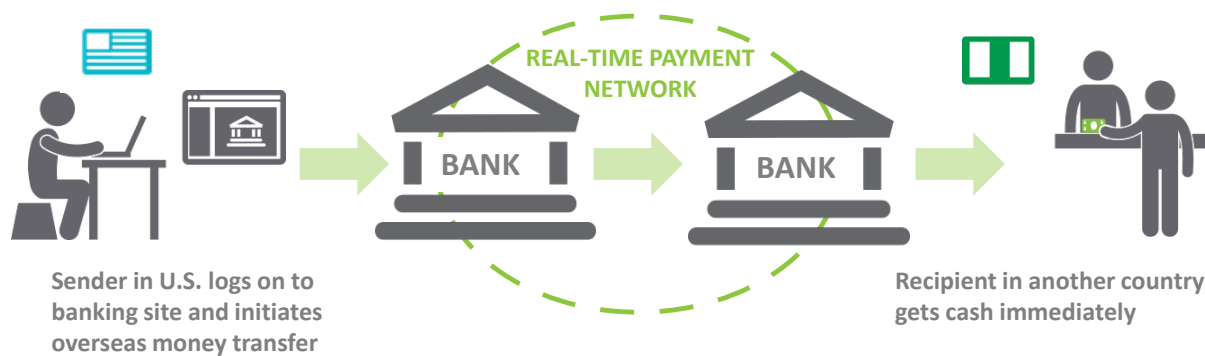
EXAMPLE: SEND MONEY TO ANOTHER PERSON



Overseas money transfers

Real-time money transfers allow your recipients in other countries to access funds quicker than if sent through a traditional money transfer service but at a much lower cost to you than paying for a wire transfer. You can send real-time money transfers safely and securely through online banking or mobile banking apps (or from your bank's branch office, if desired). Your funds can be transferred in real time either into recipients' bank accounts or – if your recipient doesn't have a bank account – to a money transfer agent's office for pick up or delivery. Alerts tell you and your recipients that the money has been transferred.

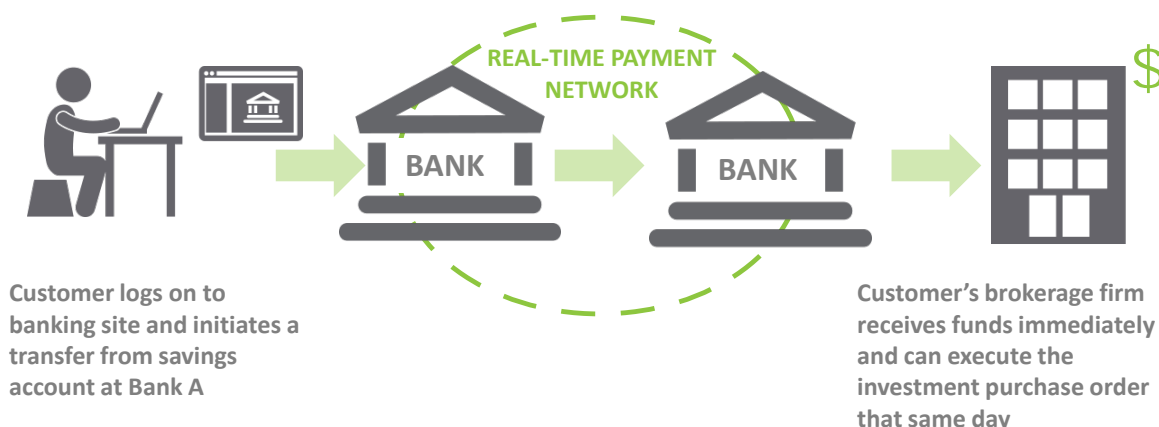
EXAMPLE: SEND MONEY TO A RELATIVE OVERSEAS



Account-to-account transfers

As the owner of multiple accounts at one or more financial institutions, you can transfer funds safely, securely and cost effectively between your accounts in real time and access your funds instantly. Using your online banking website or mobile banking app, you can make real-time account-to-account (A2A) transfers to move money from checking to brokerage accounts, from lower-interest-bearing to higher-interest-bearing accounts at different banks and from business to personal accounts as well as make other real-time transfers between accounts.

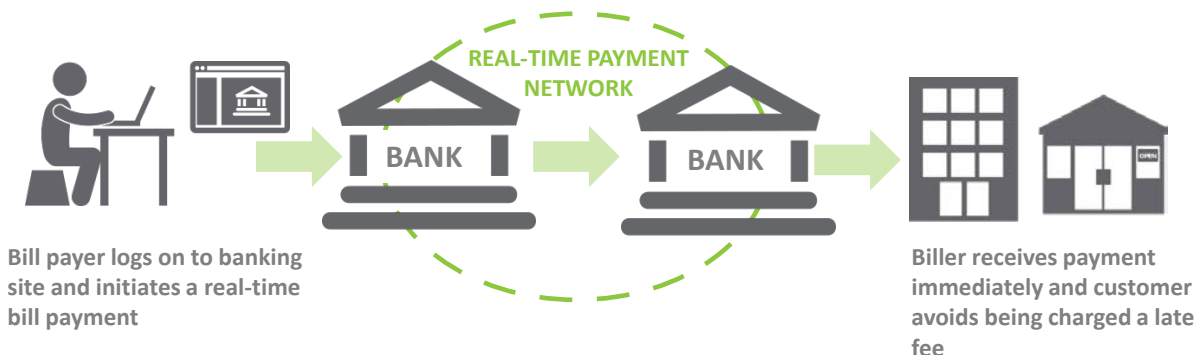
EXAMPLE: TRANSFER MONEY FROM SAVINGS TO BROKERAGE FIRM



Expedited bill payments

You can pay your bills in real time safely, securely and cost effectively through your online banking website or mobile banking app or, if desired, from your bank's branch office. Your billers with banks participating in the real-time network receive your payments instantly and you enjoy peace of mind that you won't incur late fees or risk having services shut off because your payment is bogged down in the system.

EXAMPLE: PAY BILLS ON TIME



About FIS



Global Money Movement Scale

By The Numbers

78 Million

Debit Cards

71 Million

Credit Cards

151 Million

Prepaid Cards

42 Million

Loyalty Accounts

450,000 ATMs

In Global Network

\$1.2 Trillion

Settled Annually

Overview

For the past 45 years, FIS has served the unique needs of financial services organizations around the world, helping them compete more effectively in a rapidly changing global marketplace. Every solution FIS offers – including core banking, payments processing, risk management and consultative services – is built on a client-centric foundation that supports strong strategic partnerships with more than 14,000 clients and 100,000 merchants in more than 100 countries.

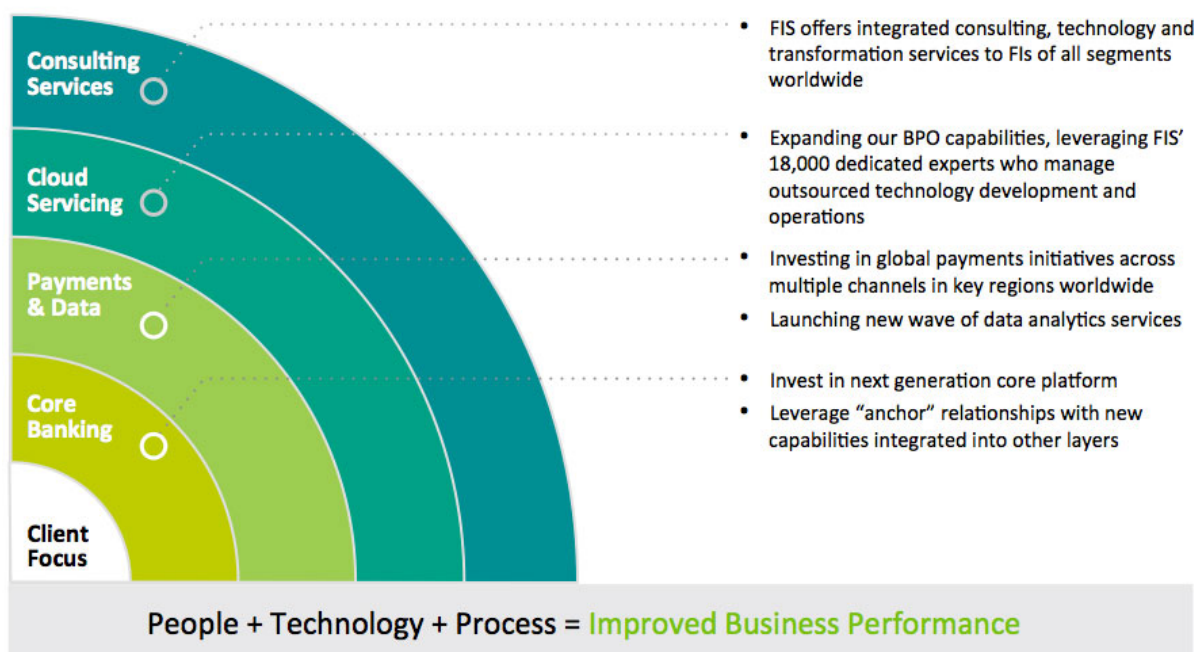
FIS delivers comprehensive solutions to more markets in more industries in more countries than anyone else in the world. Our vision is to leverage FIS' solution breadth, market reach, client relationships, and industry expertise to provide our partners with the resources to transform the way they do business.

As the leading FinTech provider, FIS settles more than \$1.2 trillion annually and provides more than 151 million prepaid cards, 78 million debit cards, 71 million credit cards, 450,000 ATMs, and two million POS locations. We process banking transactions for more than 500 million demand deposit accounts and we score more than 80 percent of the new deposit accounts opened in North America.

FIS has assembled the most complete banking and payments portfolio in the market, with more than 300 banking and payments solutions. Our company invests more than \$300 million annually in next-generation advancements, bringing to our clients the innovation they need to compete and win during changing times.

Our focus at FIS is on five distinct market segments: the North American community FI market (financial institutions below \$10 billion in assets), the North American large FI market (financial institutions above \$10 billion in assets), the international market, non-financial institution market and the global financial institutions market (those institutions with a distinctly global footprint). Each segment has its own unique set of attributes and we offer a dedicated market practice and strong set of solutions customized for each.

Our strategic vision is to partner with financial services organizations to transform the way they do business. We have invested heavily in our next-generation banking solutions and surrounded them with people, processes and technology aimed at improving business performance.



Our vision is to help Financial Institutions transform the way they do business.

FIS also offers leading consulting, compliance, transformational services and program management capabilities delivered by more than 1,500 consultants through our wholly owned subsidiary, Capco.

In addition to innovative technology solutions, we differentiate our company from other providers by offering a comprehensive cloud servicing solution. We provide industry-leading Business Processing as a Service (BPaaS) from more than 18,000 dedicated experts who manage outsourced technology development and operations.

All of these value-added layers are consolidated around our client-centric foundation – tailoring solutions to the unique needs and attributes of each market segment. Bringing together leading technology solutions with subject matter experts and refined business processes yields improved client business performance and, ultimately, sustained profitability.

FIS has also adopted a disciplined portfolio management lifecycle approach, tying our company's investment in innovation to strategies for early-stage, emerging and established solutions.

FIS' goal is to be the leading provider of real-time banking and payment solutions, delivering global connectivity and empowering our clients to drive new sources of revenue and profit from emerging payment opportunities. To this end, FIS is pursuing an open approach that unifies our existing payment assets and infrastructure (card processing, network, ePayments, and check/image) and interconnects them with other leading global payment networks.

Market Leadership

Our strategic focus has been on helping financial institutions forge lasting, more profitable relationships with their customers, and on solving their most complex business challenges. Wherever and however consumers and businesses transact, FIS will power their financial needs with market-leading solutions.

Named by Forbes Magazine in 2013 as one of the most innovative companies in the world, FIS leads the industry in innovation. Noteworthy is the fact that FIS is the only U.S. FinTech company included on the Forbes 100 Most Innovative list. Our technology investments are moving the market, creating new mobile capabilities, advancing real-time payments and using active analytics to develop a more impactful financial services experience.

FIS invests heavily in technology and product innovation, building solutions that continue to deliver the following benefits to our clients:

- Lowered total cost of ownership
- Improved profitability
- Streamlined operating leverage
- Integrated data and delivery
- Minimized risk
- Improved client service
- Multi-channel customer access
- Consistent, timely and complete account information
- Consolidated reporting

FIS' overall strategy resonates well with clients of all sizes and across many market segments, including some of the world's most successful banks, credit unions, and financial services organizations:

- Eight of the top 10 global banks
- 18 of the top 25 national retailers
- Nearly 75 percent of U.S. credit unions

We are also the partner of choice powering many of the leading direct-to-consumer integrated financial services offerings, including such brands as Ally Bank, MetLife, Sallie Mae, Schwab Bank, TD Ameritrade and E*TRADE, among others.

This approach has received industry-wide recognition. In November 2013, for the third year in a row, FIS achieved the No. 1 ranking on the FinTech 100. This marks the third time in the last six years that FIS has held the top position in the ranking by American Banker, Bank Technology News and research firm IDC Financial Insights. In addition, our company has been the recipient of 10 industry awards in 2012 for solution and service excellence.

Awards and Recognition



Among the many other accolades received by FIS are the following:

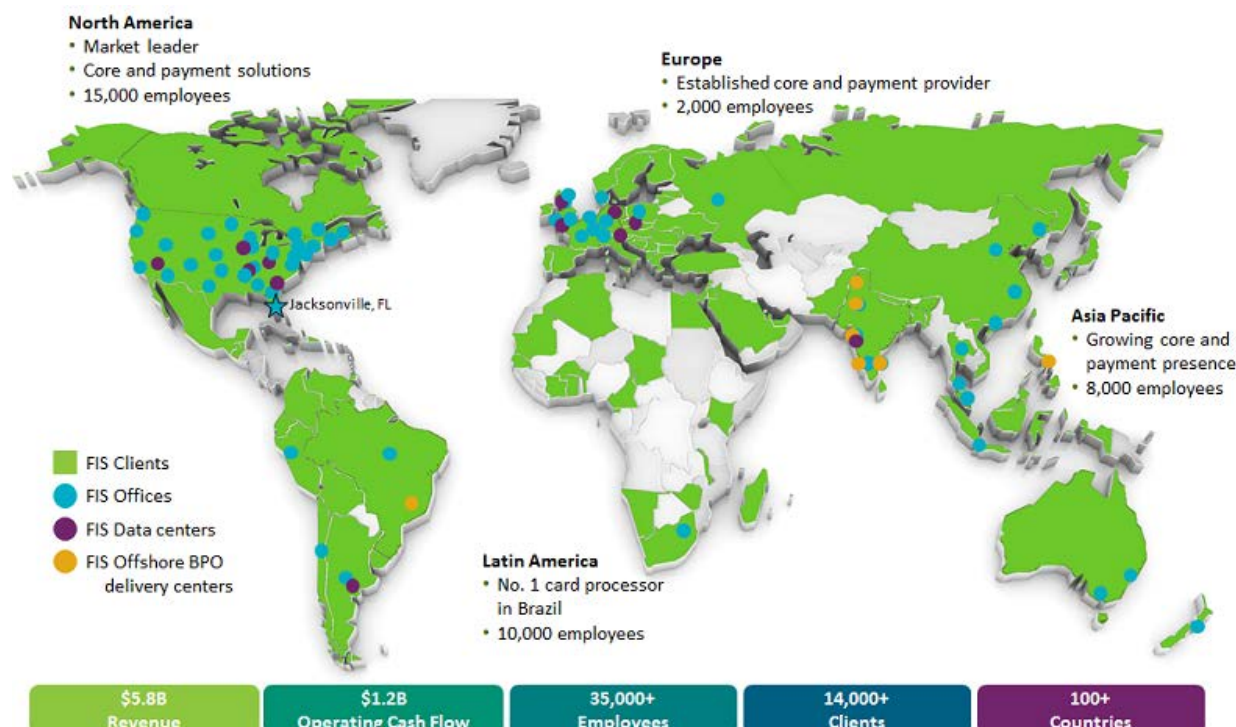
	<p><i>Tightest Integration in the Industry</i></p> <p>FIS is honored as the recipient of the Aite Group's Cash Management Solution Award for the breadth of its cash management products and services and the depth of integration across its entire product suite. FIS received three Aite awards recognizing the company's excellence in the areas of vendor experience, technology and ease of integration.</p>
	<p><i>BPO Excellence Awards</i></p> <p>FIS was named "Best Customer Experience Delivered by a Contact Centre," "BPO Innovator of the Year," "Most Significant Contributor to the BPO Industry" and received an award for "Use of Technology for Operational Excellence" at the BPO Excellence Awards organized by the Asian Federation of Business and endorsed by the Stars of the Industry Group.</p>
	<p><i>Top Ten Best Payment Platforms</i></p> <p>FIS was ranked No. 8 by the independent authority on credit card processors – topcreditcardprocessors.com – on their September 2012 list of the 10 best payment platforms.</p>
	<p><i>Paybefore Awards Best in Category</i></p> <p>FIS, U.S. Bank and Monitise Americas were recognized as "Best in Category" for Best Virtual or Mobile Prepaid Application in the 2011 Paybefore Awards for the U.S. Bank AccelaPay Mobile Banking Application – a reloadable prepaid card program.</p>
	<p><i>CEB TowerGroup "Best-in-Class"</i></p> <p>FIS' Corporate eBanking solution is identified as Best In Class in Enterprise Support and Business eBanking identified as Best in Class in Core Functionality in a recent technology analysis published by CEB TowerGroup.</p> <p><i>CEB TowerGroup, "Online Banking Systems Technology Analysis," October 2013.</i></p>
	<p><i>Service Quality Performance Award</i></p> <p>FIS received the 2011 Service Quality Performance Award from Visa® in the Issuer Processor – Lowest Assured Transaction Rate category in credit and debit card authorization. The award recognizes FIS as the issuer best able to ensure system availability to respond to authorization requests in a timely manner.</p>
	<p><i>Instant Card Issuance Award</i></p> <p>Everlink®, an FIS company, received a Silver award from Advanced Card Technologies (ACT) Canada for its Instant Card Issuance solution. The Instant Card Issuance solution provides financial institution branches the ability to quickly deliver a fully branded, personalized card on-site in less than two minutes.</p>
	<p><i>Payments Innovation – People's Choice</i></p> <p>FIS received the Payments Innovation People's Choice Award at the 2013 BAI Payments Connect Conference & Expo. Audience members voted for their favorite/most innovative presentation, and the winner for the Payments Innovation track was "FIS Mobile Wallet with Cardless Cash Access."</p>
	<p><i>Excellence in Core Banking Solutions</i></p> <p>FIS received three Aite awards recognizing the company's excellence in the areas of vendor experience, technology and ease of integration.</p>

Global Reach

As the number one technology provider to the financial industry in the entire world, we offer local sensibility on a global scale. At FIS, it's about more than just building products. It's about partnership. It's about leadership. And it's about helping our clients win. Doing that means not only understanding our clients' business and offering the highest level of service, but also never assuming that yesterday's win can get us through tomorrow's game.

FIS owns or leases support centers, data processing facilities and other facilities at over 210 locations worldwide (81 of those locations are in the United States). Internationally, FIS operates in Beijing, Hong Kong, India, Malaysia, Philippines, Singapore, Thailand, Australia, New Zealand, Barbados, Argentina, Brazil, Chile, Peru, Denmark, France, Germany, Netherlands, Poland, Slovenia, United Kingdom, Saudi Arabia, and Dubai. Our scale and expertise translate into flexible solutions and comprehensive support services that transcend the barriers of international commerce while optimizing efficiency.

Absolutely no other company is better equipped as a single solutions provider. From best-in-class core banking products to well-known payments brands like Certegy and the NYCE Network, FIS delivers the broadest and deepest range of technology solutions to the financial industry.



FIS Solutions Overview

From large, global institutions to credit unions and community banks, FIS can deliver both the breadth of solutions and depth of knowledge to solve any client's problem. FIS' clients appreciate our open, integrated solutions and acquiring the scalability to leverage innovative technologies.

We understand the challenges that financial services and payments organizations face when they need to enhance revenue, improve efficiency, manage risk, and expand customer relationships. That's why we have tailored our business model, investment strategies, and solution set to address these unique needs. With FIS, you have the confidence of knowing that our strategic direction is aligned with your current and future needs.

On the following pages you will find an overview of the products offered through our Financial, Payment, and International divisions.

Financial Solutions

Our Financial Solutions division provides comprehensive financial services software and services, with core processing, customer channel, treasury, cash management, wealth management, and capital market operations. We service the core and related ancillary processing needs of North American banks, credit unions, automotive financial companies, commercial lenders, and independent community and savings institutions.

- **Payment Processing Solutions** – Our comprehensive set of payments processing solutions provide financial institutions and other payment system participants with innovative and reliable solutions to address every aspect of payments processing from Real-Time Gross Settlement systems through all aspects of Electronic Funds Transfers on into check and remittance processing.
- **Core Processing and Ancillary Applications** – Our core processing software applications run critical banking processes for our financial institution clients, including deposit, lending, financial, customer management, and most other central systems that a financial institution must utilize to manage the solutions and services it provides to its customers.
Our Internet-enabled wealth management services allow financial services providers to address the specific needs of the rapidly growing wealthy, affluent, and emerging affluent markets, as well as commercial customers.
- **Channel Solutions** – Our suite of retail delivery applications enables financial institutions to integrate and streamline customer-facing operations and back-office processes, thereby improving customer interaction across all channels (e.g., branch offices, Internet, ATM, and call centers).
- **Decision and Risk Management Solutions** – Our decision solutions cover the full spectrum of the account lifecycle, from helping to identify qualified account applicants to managing mature customer

Financial Solutions Highlights

Leading provider of core technology to a broad range of financial institutions

The only FinTech provider with combined core and payment capabilities outside of North America

Fraud risk for deposit transactions assessed and detected by advanced authentication procedures, predictive analytics, artificial intelligence modeling, neural networks, and proprietary and shared databases

Proprietary risk management models and data sources to assist in detecting fraud and assessing the risk of opening a new account or accepting a check at the point of sale, a branch location, or through the Internet

Outsourcing teams that manage costs, improve operational efficiency, transform processes, and deliver world-class customer service

accounts and fraud. Our applications include know-your-customer, new account decisioning, new account opening, account and transaction management, fraud management, and collections.

- **Global Commercial Services** – Our global commercial services include solutions, both onshore and offshore, designed to meet the technology challenges facing principally U.S.-based clients, large or small. Our technology solutions range from consulting engagements to application development projects, and from operations support for a single application to full management of information technology infrastructures.
- **Strategic Consulting Services** – We have expanded our capabilities to provide integrated consulting, technology, and complex, large-scale transformation services with a recent consulting service acquisition that specialized in banking, capital markets, wealth and investment management, finance, technology and risk and compliance.

Payment Solutions

Our Payment Solutions division services payment and electronic funds transfer needs by providing a comprehensive set of software and services for the EFT, card processing, item processing, bill payment, and government and healthcare payments processing needs of our customers.

- **Electronic Funds Transfer** – Our electronic funds transfer and debit card processing businesses offer settlement and card management solutions for financial institution card issuers. We provide traditional ATM- and PIN-based debit network access and emerging real-time payment alternatives through NYCE. We are also a leading provider of prepaid card services which is a fast growing channel. Services include gift cards and reloadable cards with end-to-end solutions for development, processing, and administration of stored-value programs.
- **Credit Card Solutions** – Thousands of financial institutions utilize a combination of our technology and/or services to issue VISA®, MasterCard®, or American Express® branded credit and debit cards or other electronic payment cards for use by both consumer and business accounts. Our services range from card production and activation to an extensive range of fraud management services to value-added loyalty programs designed to increase card usage and fee-based revenues.
The majority of our programs are full service, including most of the operations and support necessary for an issuer to operate a credit card program. We do not make credit decisions for our card issuing customers, nor do we fund their receivables. In addition, our merchant card processing service provides everything a financial institution needs to manage its merchant card activities including point-of-sale equipment, transaction authorization, draft capture, settlement, chargeback processing, and reporting.
- **Item Processing and Output Services** – Our item processing services furnish financial institutions with the equipment needed to capture data from checks, transaction tickets, and other items; image and sort items; process exceptions through keying; and perform balancing, archiving, and the production of statements. Services are performed at one of our item processing centers located throughout the U.S. or on-site at customer locations. Our extensive solutions include distributed data capture, check and remittance processing, fraud detection, and document and report management.

Payment Solutions Highlights

Support for more than 71 million credit card accounts, 42 million loyalty accounts, 151 million prepaid cards and 78 million debit cards

More than 7,000 debit, credit and checking account loyalty and rewards programs

More than 680 million prepaid card transactions processed annually, representing over \$35 billion in value

Support more than 450,000 ATMs globally and two million POS locations through its NYCE EFT/PIN-debit network



Output services that are ancillary to our primary payment solutions include print and mail capabilities and card personalization fulfillment services. Our print and mail services offer complete computer output solutions for the creation, management, and delivery of print and fulfillment needs.

- **ePayment Solutions** – We provide reliable and scalable solutions for consumer and business online bill payment, person-to-person payments, biller direct and ACH processing. Each solution has the functionality to meet your needs and the needs of your end users.
- **Check Authorization** – Our check authorization business provides check risk management and related services to businesses accepting and cashing checks. Our services assess the likelihood (and often provide a guarantee) that a check will clear. Our check authorization system uses artificial intelligence modeling and other state-of-the-art technology to deliver accuracy, convenience, and simplicity to retailers.

International Solutions

FIS provides local services to our clients in more than 100 countries around the world. The services delivered by FIS in these locations provide many of the same financial and payments solutions we offer in North America, including:

- Core banking applications
- Channel solutions
- Card and merchant services
- Item processing
- Check risk management solutions

Our international operations leverage existing applications and provide services for the specific business needs of our customers in targeted international markets. Services are delivered from 29 global operations centers throughout Latin America, Europe, the Middle East, Africa, Asia and Australia. Our payment solutions services include fully outsourced card-issuer services and customer support, item processing, and retail point-of-sale check warranty services. Our financial solutions services include fully outsourced core bank processing arrangements, application management, software licensing, and maintenance, facilities management, and consulting services.

International Solutions Highlights

The No. 1 retail core processor in Germany

Leading provider of third-party card processing in Brazil, Australia, New Zealand and Thailand

FIS Guiding Principles

FIS relies on five guiding principles to define our corporate culture:

**Client
Focus**

**Market
Leadership**

**Operational
Performance**

**Employee
Engagement**

**Community
Involvement**



- **Client Focus.** Value every client, protect each relationship, and never compromise our unmatched standards of excellence.
- **Market Leadership.** Lead the markets we serve by delivering unparalleled value through our entrepreneurship, technology leadership, and financial expertise.
- **Operational Performance.** Commit to delivering premier performance – simplifying and improving daily processes, while maintaining industry-leading information security, and risk management.
- **Employee Engagement.** Drive a high degree of employee engagement, while upholding the highest standards of openness, honesty, and ethical behavior.
- **Community Involvement.** Be engaged with the global communities in which we live and work, through philanthropic and civic involvement. FIS has established “The FIS Charitable Foundation” (the Foundation), a non-profit, non-stock corporation that serves as the primary source for corporate charitable contributions. The Foundation complements the philanthropic and volunteer efforts of our employees by providing financial support to qualified organizations operating within our areas of focus: Education, Health and Human Services, and Community Development.

“It’s just this simple: if we do the right thing for our clients, our employees and our community, we will be successful.”

-Frank Martire, Chairman of the Board and Chief Executive Officer, FIS

Company History

FIS traces its history to the 1960s with the inception of data processing services at Marshall & Ilsley Bank (the predecessor to Metavante) in 1964 and the subsequent launch of the Systematics core banking solution in 1968. Since then, the company has continued to expand its service offerings for financial institutions of all sizes, including credit unions, community banks, and more.

Beginning in the late 1990s, the company experienced explosive growth and change – acquiring more than 40 companies including such industry leaders as Certegy (2006), eFunds (2007), Metavante (2009) and Capco (2010). This acquisition growth enabled the company to expand its current banking and payment capabilities and enter new global markets. A former subsidiary of Fidelity National Financial (FNF), FIS was spun off into a separate, publicly traded and NYSE-listed company (NYSE: FIS) in 2006.

The combination of organic and external growth has positioned FIS as the number one technology provider for the financial services industry. Visionary leadership and premier client service have earned FIS a place on the short list of providers capable of offering unmatched breadth and depth of solutions to so many financial institutions and retailers throughout the world.

