

White Paper



REAL TIME IN REAL LIFE: THE IMPACT OF A REAL-TIME PAYMENTS SYSTEM ON ITS USERS



About “Real Time in Real Life”

The Payments Innovation Alliance, a membership program of NACHA — The Electronic Payments Association®, developed this paper. The goal of this paper is to inform the industry globally on the realities of deploying a real-time payments system for users, including a description of the benefits, opportunities and challenges of users utilizing such a system.

About the Payments Innovation Alliance

The Payments Innovation Alliance brings together diverse, global stakeholders to support payments innovation, collaboration, and results through discussion, debate, education, networking, and special projects that support the ACH Network and the payments industry worldwide. The Alliance brings together content and focus across all payment areas, including emerging payment technologies, electronic billing and presentment, mobile, payment security/risk, check conversion and global payments. Membership includes organizations of all sizes and spans the payments industry spectrum.

About NACHA – The Electronic Payments Association

Since 1974, NACHA – The Electronic Payments Association has served as trustee of the ACH Network, managing the development, administration and rules for the payment network that universally connects all 12,000 financial institutions in the U.S. The Network, which moves money and information directly from one bank account to another, supports more than 90 percent of the total value of all electronic payments in the U.S. Through its collaborative, self-governing model, education, and inclusive engagement of ACH Network participants, NACHA facilitates the expansion and diversification of electronic payments, supporting Direct Deposit and Direct Payment via ACH transactions, including ACH credit and debit payments; recurring and one-time payments; government, consumer and business transactions; international payments; and payments plus payment-related information. Through NACHA’s expertise and leadership, the ACH Network is now one of the largest, safest, and most reliable systems in the world, creating value and enabling innovation for all participants. Visit www.nacha.org for more information.

This paper is intended for educational purposes only. It should not be relied upon for legal advice. Readers should consult attorneys for legal advice.

Acknowledgements

This paper was developed with the collaboration of many stakeholders. The Payments Innovation Alliance would like to acknowledge its members who provided recommendations and expertise during its creation.

Neville Arjani

Research Lead
Canadian Payments Association

Nell Campbell-Drake, AAP

Vice President
Federal Reserve Bank of Atlanta

Jessica L. Cheney, AAP, CTP

Director, Product Strategy Solutions
Bottomline Technologies Inc.

Frank D'Amadeo

Director, Treasury Operations
Con Edison

Chad Hauff

Product Development Manager
Safety Insurance Company

Muneeb Iqbal Shah

Lead Consultant
Wipro Ltd.

Taiji John Kaneda, AAP

Corporate Product Manager
UMB Bank, N.A.

Pam Kennaley, AAP

Operations Manager
American Express Centurion Bank

Eric Lim

VP, Online Payments
U.S. Bank

Leo J. Lipis

Managing Director
Lipis Advisors

Timothy Mills, AAP

VP & Executive Director
The Clearing House Payments Association

Anita S. Patterson, CTP

Director, Treasury Services
Cox Enterprises Inc.

Matt Pfaltzgraf

Product Manager
SHAZAM Inc.

Nasreen Quibria

Managing Director and Founder
Q insights

Les Smith

ACH Sales and Business Development
Jack Henry & Associates

Dan Thomas

Senior Payments Consultant
Mindful Insights LLC

Jane S. Wallace, AAP

Principal
Wallace Consulting

Kristin S. Walle, AAP, CTP

VP, Global Money Movement & Comp.
ADP Inc.

Laura Weinflash

VP, Market Strategy
Early Warning Services LLC

Edward R. Woods

Principal
Mindful Insights LLC

Additionally, the Payments Innovation Alliance would like to extend a special thanks to the Lipis Advisors team in Germany, Leo Lipis and Colin Adams, for their significant efforts to develop this white paper.

Note: The views presented in this white paper do not necessarily reflect the individual views of each member of the project team, the entities or organizations that employ the members of the project team, the Payments Innovation Alliance Leadership Team, or the individual Alliance member organizations.

Executive summary

Payments system modernization efforts are becoming increasingly common across geographies and these efforts are leading to interest in, development of, and increasing utilization of real-time, low-value payments systems. Consumer and business expectations and demand for speed in payments, coupled with evolving payment types, have highlighted a need for faster options for multiple use cases. However, as industry professionals address real-time payments, it is evident that “real time” can mean many different things, with vastly different implications to users of the system. NACHA’s Payments Innovation Alliance recognizes that, as an industry, we need to further explore and fully understand what a real-time system would mean from an end-to-end perspective.

The primary focus of this paper is the implications to users of rolling out a real-time payments system. An extended discussion of issues such as posting and funds availability and settlement between financial institutions is considered out of scope. While these issues will be touched on briefly to set the context, the focus instead will be on exploring what real time means, outlining the challenges to implementing real time, and focusing on the benefits and opportunities that real time brings.

The goal of this Alliance opinion paper is to inform the industry globally on the realities of real-time deployment, and explore how businesses, consumers, and financial institutions can implement and utilize a real-time payments system in the U.S. Through answering these questions, this paper seeks to bring the concept of real time to real life.

Defining real time

While real-time payments systems are proliferating around the globe, there is still no single, universally agreed upon definition of a real-time payment. Based upon common characteristics from various global real-time payments systems, the Payments Innovation Alliance defines a real-time payment as an immediate, irrevocable, interbank account-to-account transfer that utilizes a real-time messaging system connected to every end-user through a financial institution, third party, or another real-time system.¹ Funds are available for use by the receiver and real-time confirmation is provided to both the sender and receiver in seconds.

A real-time payments system is a synchronous messaging system with request and response capabilities that operates between financial institutions, third parties, gateways and directly connected businesses in real time. Prior to the initiation of payment instructions to the receiver’s financial institution or third party, good funds are confirmed, and with this certainty of settlement, there is immediate debiting and crediting of the sender’s and receiver’s accounts at their respective financial institution/third party. A proxy database that allows users to make a real-time payment without the sender or receiver knowing the other’s banking information is assumed, as is the ability to send or receive payments 24/7.

¹ This definition does not preclude two customers of the same financial institution serving as sender and receiver to the same real time payment transaction.

How does real time work?

A real-time payment has three distinct components: authorization, posting and settlement. Real-time payments systems must provide authorization and posting of funds in real time, but settlement does not necessarily have to occur in real time. Other important elements include the payment types covered (credits/debits), message flows, messaging standards, and overlay services.

Authorization, posting, and settlement

Authorization includes both the initiation of payment instructions by the sender, and the real-time acceptance by the sending and receiving financial institutions/third parties of the payment request via a real-time messaging element. Unlike authorization and posting, settlement between financial institutions/third parties does not have to occur in real time. In fact, the majority of real-time systems today utilize a deferred net settlement method. Real-time gross settlement (where each transaction is settled individually in real time) has the least risk, but requires high liquidity costs for banks. In contrast, deferred net settlement multiple times a day eases liquidity management, with settlement risk controlled through a range of guarantees (typically through collateralization or pre-funding of settlement obligations).

For end-users, settlement between financial institutions is unimportant. The key factors for them are the quick confirmation/rejection notice and the immediate availability of funds. These two factors are what create a real-time experience for consumers and businesses.

System rules and data standards

Issues such as return rights, liability for fraud, and mandated times for posting and/or settlement will be of particular importance in the scheme rules for real-time payments. Limiting real-time processing to credit (“push”) transactions is a best practice that has been adopted by almost all real-time systems today. Credit only transactions offer more security, more protection from fraud, and additional sender control and do not feature the complexity of direct debit transactions, which require mandate management and return rights that would be difficult to provide in a system that offers instant, irrevocable transactions. Nigeria’s NIP and Singapore’s FAST (G3) systems do have the capability to support both credits and debit-like functionality, but neither these systems, nor any other real-time system the Alliance is aware of, currently allows consumers or businesses to initiate real-time debit (“pull”) transactions.^{2,3} Instead, the few real-time systems that allow payees to initiate debit-like transactions actually offer real-time requests for credit or real-time requests for debit, with the payer ultimately authorizing the real-time payment.

The system rules also will need to determine a data standard for the exchange of real-time payment messages, and the rules will need to define how to interpret and utilize specific information in a consistent way for all users. ISO 20022 has become the de facto messaging standard for new real-time systems, with many existing real-time systems that do not use ISO 20022 exploring ways to migrate to the standard in the future. For many

² FIS “Flavours of Fast” 2nd Edition 2015

³ PaymentsNZ “Payments Now” 2015

reasons, including flexibility, extensibility, future domestic and international interoperability, and the fact that the ISO 20022 message format supports real-time payment tracking and reporting and additional detailed remittance information to aid in fraud and risk mitigation, the use of ISO 20022 as the message standard is recommended.⁴

Value limits, fraud screening and value-added services

Some real-time infrastructures institute a system-wide value limit for individual transactions to reduce the risk associated with putting high-value transactions in a system that does not settle in real time. Other real-time systems see individual financial institutions/third parties setting maximum transaction values for their customers. While the onus for fraud screening typically falls on individual financial institutions (regardless of payment type), implementing a centralized fraud screening capability at the infrastructure operator level could help identify patterns of fraudulent transactions across multiple financial institutions.

Real-time payments systems offer many opportunities for developing value-added services either at the central infrastructure level or at individual financial institutions/third parties. One of the most integral services that is assumed will be part of any real-time solution in the U.S. is a proxy database that allows end users to send or receive payments without the need to share bank account details. Other systems that offer centralized proxy databases (such as Sweden and the UK) use a mobile phone number, but other easily remembered proxies such as an email address could also be used to provide maximum convenience for end users.

Real-time in the United States

The following characteristics are assumed essential in an American real-time system(s), as well as in other countries' future systems:

- 24/7 availability
- Close to immediate authorization or rejection of payment to sender and receiver (within seconds)
- Close to immediate funds posting and availability for the receiver (within seconds)
- Credit transfers only ("push" payments)
- Use of ISO 20022 message standard
- Irrevocability
- Availability of a proxy database allowing end users to send and receive real-time payments without knowledge of the receiver's bank account information

⁴ More information on ISO 20022 for real-time payments can be found at <http://www.iso20022.org>

Use cases and user impact

The development of a real-time payments system is more than just an interesting exercise for payments professionals. To ensure success, it must be coupled with clear propositions for each use case so that end-users and financial institutions can realize the benefits that real-time payments systems offer. Industry stakeholders also need to understand the challenges involved in implementing and operating a real-time payments system to ensure that consumers, businesses, and financial institutions gain value from the system.

Use cases

Real-time payments systems have an impact on all major stakeholder groups and use cases. The four main use cases for a real-time system include:

- **P2P** (Person-to-Person): where a consumer pays another consumer or very small business or moves money between two of their own accounts
- **C2B** (Consumer-to-Business, includes Consumer-to-Government): includes last-minute bill payments or tax payments, online/mobile merchant payments
- **B2C** (Business-to-Consumer, includes Government-to-Consumer): emergency payroll payments or payrolls for temporary or hourly workers, insurance payments, disaster relief, customer refunds
- **B2B** (Business-to-Business, includes Business-to-Government): includes a business making a just-in-time supplier payment, a last-minute bill payment, an account-to-account payment to consolidate money in one account

Real time can enable new or improved products and services that target one or multiple use cases. The following table outlines these products across user segments:

Product/service	P2P	C2B	B2C	B2B
Just-in-time payments	√	√	√	√
Certainty of payment and visibility of funds	√	√	√	√
Improved resource management			√	√
Improved working capital			√	√
Payment tracking	√	√	√	√
Increased straight through processing (STP)		√		√

Some of these products and services are used frequently in countries that have real-time systems today. Small businesses in the UK use real-time payments to increase working capital and improve resource management, while consumers in Sweden use the Swish mobile payment app to make P2P and C2B payments in real time using their mobile phones. Other products such as payment tracking, which can increase automation of supply chain management and increase working capital for suppliers, are less common. New products and services can be developed once a real-time system is in place as consumer and business expectations change and new value propositions are identified.

For end-users, having a suite of new products and services offered by their financial institution or a third party can improve the convenience, security and speed of how they make payments. But the focus is not on the products themselves, but on the opportunities they provide. The following section will look more closely at the benefits real time can bring consumers and businesses.

Benefits and opportunities

Real-time payments systems offer many benefits and opportunities for end-users. The fact that all system stakeholders – businesses, consumers, financial institutions, and third parties – have the ability to make real-time payments will foster open competition and result in increased convenience, security, and control. Real time also provides greater transparency for the payment process by providing businesses and consumers with up-to-the-minute visibility of funds. The benefits for businesses and consumers in particular will be explored further here.

Benefits for businesses

- Greater transparency due to constant visibility of funds
- Improved payments reconciliation
- Reduction or elimination of unauthorized payments
- Reduced reliance on cards for merchants
- Compliance with local laws requiring same-day payments for terminating employees or hourly workers
- Increased flexibility in data to achieve greater STP
- Improved customer service and overall customer satisfaction

As a sender, businesses gain the ability to make immediate payments to consumer customers and improve their customer satisfaction (B2C), as well as to make just-in-time payments to suppliers and have the funds credited to their account immediately (B2B). Companies also would have the ability to use the system for infrequently made payments, such as commercial filings at the Federal, state, or local levels. A real-time payments system will allow for improved resource management as it will enable “point-in-time” resource scheduling, and create an opportunity to utilize electronic payments when complying with local laws that require same-day payment for terminated employees. It provides a safety net, allowing payments to be made in a contingency situation, and it could potentially remove the need for positive pay processes during emergency situations, such as the elimination of the need for insurance claim adjusters to validate approved payment type transactions for accounts.

As a receiver, businesses gain the ability to improve their working capital, as funds will be credited to their financial institution immediately. They receive certainty of payment – the payment is irrevocable and payment instructions are not sent unless there are sufficient funds. This lowers the risk of payment exceptions as insufficient funds (NSF) would not be a possibility, and unauthorized payments should be significantly reduced or eliminated.

The recommended use of ISO 20022 payment messages is another significant opportunity for businesses. Other countries and some multinational companies have already implemented ISO 20022 payment functionality, and the use of this standard with real-time payments would allow ACH payments, wire transfer payments, and real-time payments to all utilize the same international payment standard. The potential use of the same standard for all payment types will streamline internal processes associated with making and receiving a variety of payments.

Real-time payment systems may have the capability required to provide the necessary information for businesses to post payments quickly, reducing exceptions and eliminating the need to return payments that cannot be posted. If so, this would allow the business to provide better customer service and to reduce calls from customers checking to see if their payment was received, and this increased customer satisfaction can translate to increased customer loyalty.

For merchants, the development of real-time payment capabilities at the point of sale or for e-commerce can help reduce costs. This in turn can improve a merchant's working capital and allow them to lower prices or offer discounts to consumers that choose to pay with a real-time payment.

Benefits for consumers

- Ease of use and increased security via proxy database
- Improved financial control and budgeting due to certainty of payment status
- 24/7 payments functionality
- Increased access to innovative payment products

Many consumers are skeptical of giving out their bank account details to allow another person or business to send them a payment. A proxy database that connects bank account details to a proxy name or number such as a mobile phone number or email address means that end users no longer have to provide their bank account details to multiple parties or to any external party to send or receive real-time payments, thereby providing convenience. To increase security, the directory services provided by these proxy databases can provide an optional feature for users to register and successfully complete a process to verify that they in fact own the account and the associated telephone number or email address. This proxy database could also be leveraged by other payment platforms including ACH and wire payments. Having the ability to both send and receive payments to any bank account, both in real-time 24/7 or via traditional payment methods, would improve consumer convenience immeasurably.

A consumer will have an ability to control the timing of their payments. A real-time payment is designed to be fast and enable consumers to use a single payment method through multiple channels (P2P, point-of-sale (POS), e-commerce, etc.). Using immediate payments will provide both the sending and receiving consumer with better financial control and budgeting ability due to the real-time crediting and debiting of their accounts. This is also an opportunity for financial institutions and third parties, which could develop apps and other services aimed at helping consumers budget their funds and exercise financial control over their bank accounts. Once a real-time system is

implemented and volume grows, innovative products and services will begin to be created that perhaps were not envisioned when the system went live.

Benefits for financial institutions/third parties

Financial institutions/third parties will have the ability to offer additional value-added services and products on top of the real-time system for new revenue opportunities – such as allowing a business to check for the “postability” of a transaction before accepting a payment. Other examples of value-added products and services include financial institutions/third parties offering a receiver the ability to send a message back through the system to the sender at a later time when they have determined if they are able to post the payment instructions, or if they require additional information or changes in the way the payment instructions are sent for the next payment.

A real-time payments system enables financial institutions to provide better customer service to its consumer and corporate customers. This increases customer satisfaction and customer stickiness, which can help keep financial institutions relevant in light of other emerging technologies. Entrenching its role at the heart of payments is perhaps the biggest benefit financial institutions can draw from the development of real-time payments systems.

Challenges

As promising as real time’s potential to positively change the way consumers and businesses make payments is, it is not without challenges. Legacy payment infrastructures, business rules and payment habits have developed over decades, and changing these will require a strategic and practical focus that may be difficult for payments system stakeholders to implement. This section will outline some of the challenges faced by consumers and businesses when dealing with real-time systems.

Challenge	Business	Consumer	FI
Need to educate end-users on change in payment practices	√	√	√
Overhaul of internal IT systems and/or business practices	√		√
Ability to handle different remittance information and formats	√		√
Lack of interoperability between ISO 20022 implementations	√		√
Setting appropriate transaction value limits	√		√
Harmonizing consumer protection laws with irrevocability of real-time payments		√	
Reluctance to give up refund rights involved in other payment types (cards, direct debits)		√	
Update existing reconciliation and backroom integration processes	√		
Develop real-time reporting capabilities			√
Comply with existing regulation (KYC, AML/CTF) in real-time environment			√

Challenges for businesses

As a receiver, a business will need to either update its internal systems to allow real-time customer payments to post immediately, or to retroactively post payments effective as of the time/date stamp on the real-time payment. This may require designing new non-batch based processes that allow their systems to process a large number of individual transactions very quickly. It may be necessary to do both if the business' internal systems are not available for updating 24/7. In addition, some companies do not currently receive C2B credits and remittance information as part of their posting file from their financial institution, and would need to update their posting file processes and procedures to include real-time credit payments. As a sending business, it will be necessary to either update internal software to create individual payments, or for the company or their financial institution/third party to create a method for the business to submit payment messages in batches.

The use of ISO 20022 may require businesses to convert their internal systems to utilize the standard either through the use of conversion software or by fully migrating to the standard for payments messaging. There are currently international efforts to harmonize the usage of ISO 20022 for low-value payments including the work being done by the ISO 20022 Registration Management Group (RMG) Real Time Payments Group. As both domestic and global interoperability is critical, the authors believe any domestic US real-time system should use the remittance standard that is supported globally when these harmonization efforts are complete.

Any real-time payment that involves a business as a sender or receiver will require the message to contain the necessary remittance information to identify the payment. ISO 20022 supports extensive remittance data traveling with the payment instruction, however some systems, such as SEPA, have set limits to remittance information with payment messages, and some groups working on global harmonization of standards believe that a limited amount of structured remittance should be supported, with any additionally needed information traveling separately. Businesses that have already implemented STP processes utilizing payments plus remittance information will need to evaluate changes to their A/R and A/P systems to accommodate different levels or types of remittance information.

It will be important that any limits on transaction amounts be set at a high enough level to expand use cases for B2B payments beyond small value payments to encourage usage of the system by businesses of all sizes. If the individual transaction value limit is too low, businesses will not be able to make important payments and use of the real-time system would be skewed toward consumer payments. As real-time payment networks introduce the concept of value and remittance data limits, it is important to remember that businesses will still be able to use traditional payment rails for transactions that exceed these limits.

Senders will expect credits to be applied immediately to their accounts with a business and this may cause customer service issues for receiving businesses. Receiving businesses may need to educate both consumer and business customers (senders) to ensure additional customer service time is not required to deal with sender questions or dissatisfaction. A suggested good business practice would be to make sure internal systems can place some sort of acknowledgement that funds were received on

the customer's account so that it is visible to call center representatives and through online systems until the money is actually applied to the internal account.

Challenges for consumers

It is important that the end-user experience for consumers be as simple and easy as handing cash to another person. Due to most consumers' lack of familiarity with real-time payments, it will be important to educate consumers as to how the process works. It is particularly important to stress the irrevocability of real-time payments and to build in safeguards such as double entry and confirmations to ensure that the consumer is aware of how much and to whom they are sending money.

Consumer protection laws could also pose challenges to irrevocable electronic consumer payments. Although consumer cash transactions are irrevocable, it is possible that regulatory bodies will not allow the same level of finality for an electronic consumer transaction. The Consumer Financial Protection Bureau (CFPB) recently issued "Consumer Protection Principles: CFPB's Vision of Consumer Protection in New Faster Payment Systems," which emphasizes that these new faster systems should include strong fraud and error resolution protections. There may need to be messages built into the system to allow the sending financial institution to request the receiving financial institution return the payment in cases of fraud or error by the consumer. Adoption may suffer if consumers are concerned about the protections offered with real-time payments, and thus continue to use direct debits or cards for C2B payments.

Consumers will expect that their account with a business will be credited immediately (e.g. for a bill payment), not just that the funds will be placed in the business' bank account. Some businesses may be capable of this and some may not, thus it will be important to educate consumers on how the process will work or adoption of the system could be limited. There may be an additional need to clarify the rules around crediting consumers' accounts with business either via the payments system rules or in additional regulation.

Challenges for financial institutions / third parties

Financial institutions will need to have an automated real-time connection to both the real-time payments system and to all of its customers, and the staff necessary to interact with the system and handle any exceptions. Many financial institutions currently do not have the ability to provide real-time reporting to their customers or real-time flow of information between internal systems, and doing this would require an upgrade to their systems. Many financial institutions also lack the ability to include C2B credits and remittance information in corporate posting files and would need to update their processes and procedures to include real-time payments. In addition, financial institutions will need to be able to operate in a 24/7 environment to send and receive payment instructions and responses, to perform necessary edits and checks upon transactions, and to post debits and credits to their customers' accounts within the system's required timeframes. Many financial institutions will need to either hire additional staff, fully automate or outsource functions in order to meet the 24/7 requirements of the system.

Both the sender's financial institution/third party and the receiver's financial institution/third party will need to have commercially reasonable authentication and verification protocols in place for the message sender and the message receiver. This process is critically important given the irrevocability of real-time payments. All applicable regulation around authentication will need to be followed, and commercially reasonable procedures used that are in accordance with current regulatory requirements. Financial institutions will need to implement real-time fraud detection systems including fraud screening for transactions being sent and monitoring of suspicious activity on receiving accounts. In addition, they will need to ensure their ability to perform all necessary regulatory transaction checking in real time.

Conclusion

As consumer and business expectations evolve, third parties continue to create innovative solutions using modern technology, and regulators craft new regulations to keep up with the pace of change, the development of real-time payments systems increasingly becomes a necessity, not a luxury. The Payments Innovation Alliance membership, which includes representatives from all stakeholders in the U.S. payments systems and abroad, has provided an understanding of the assumptions, goals and opportunities for real-time payments systems as a result of engagement, dialogue, and industry research. There are many lessons that can be learned from those that have had varied successes in real-time payment adoption. Real-time payments systems are much more than a faster version of legacy payment infrastructures. Real-time has the potential to drastically change the way consumers and businesses make payments and interact with their financial institutions.

While real time will create new revenue opportunities and could contribute to cost savings, challenges do exist for consumers, businesses, and financial institutions. The true value of real-time payments lies in the user experience. As a result, real-time payments systems should consider the implementation and ongoing challenges that lay ahead of end-users. To meet customer expectations and still benefit from processing efficiencies, there can be significant system upgrades necessary for businesses that choose to take full advantage of real-time payments. Payments regulation and fraud also may bring new challenges for financial institutions in the real-time environment.

The end-user challenges identified by the Payments Innovation Alliance are not impediments that will prevent the development of real-time payments systems, but meant to provide insight to the potential impacts to users, as well as anticipated benefits. By focusing on the impact, both positive and negative, to the end-user, as well as the strategic and business opportunities real time enables, a real-time payments network and its stakeholders can successfully move to real time while positioning themselves to meet future needs.

Appendix 1: List of additional resources

FIS Flavours of Fast 2nd Edition

https://www.fisglobal.com/ucmprdpub/groups/public_searchable/documents/webaset/c038914.pdf

EACHA Study on Interoperability of Immediate Payment Systems

http://www.eacha.org/form_download.php?doc=EACHA%20Study%20on%20Interoperability%20of%20Immediate%20Payment%20Systems

Federal Reserve Strategies for Improving the U.S. Payment System

<https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf>

Lipis Advisors Global Payment System Analysis

<http://www.lipis.net/gpsa-2014/>

PaymentsNZ Research Paper Payments Now: Researching and reviewing the world of real-time payment systems

<http://paymentsnz.co.nz/articles2/the-world-of-real-time-payment-systems>

SWIFT White paper: The Global Adoption of Real-Time Retail Payments Systems

http://www.swift.com/assets/swift_com/documents/products_services/White_Paper_Real_Time_Payments.pdf

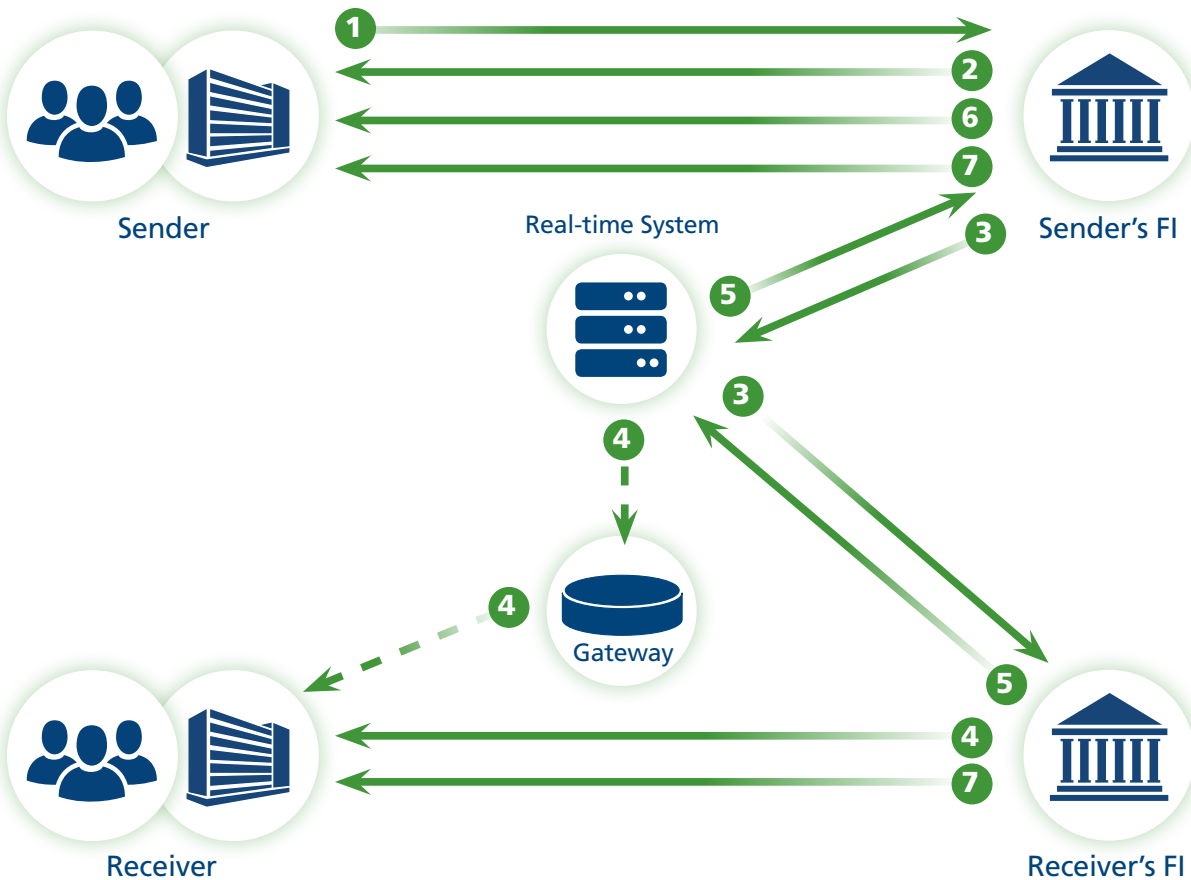
Additional information on ISO 20022

<http://www.iso20022.org>

Appendix 2: Real-time system schematics and exception handling

There are two different ways for a payment instruction to flow through the real-time system. In the first instance, a sender begins the process by initiating payment instructions through their financial institution or third party. If the sender or receiver is a business, it may choose to use a gateway to connect to the real-time payments system rather than its financial institution or could also have a direct connection to the system if the scheme rules allow for direct corporate access.

Real-time credit transaction flow



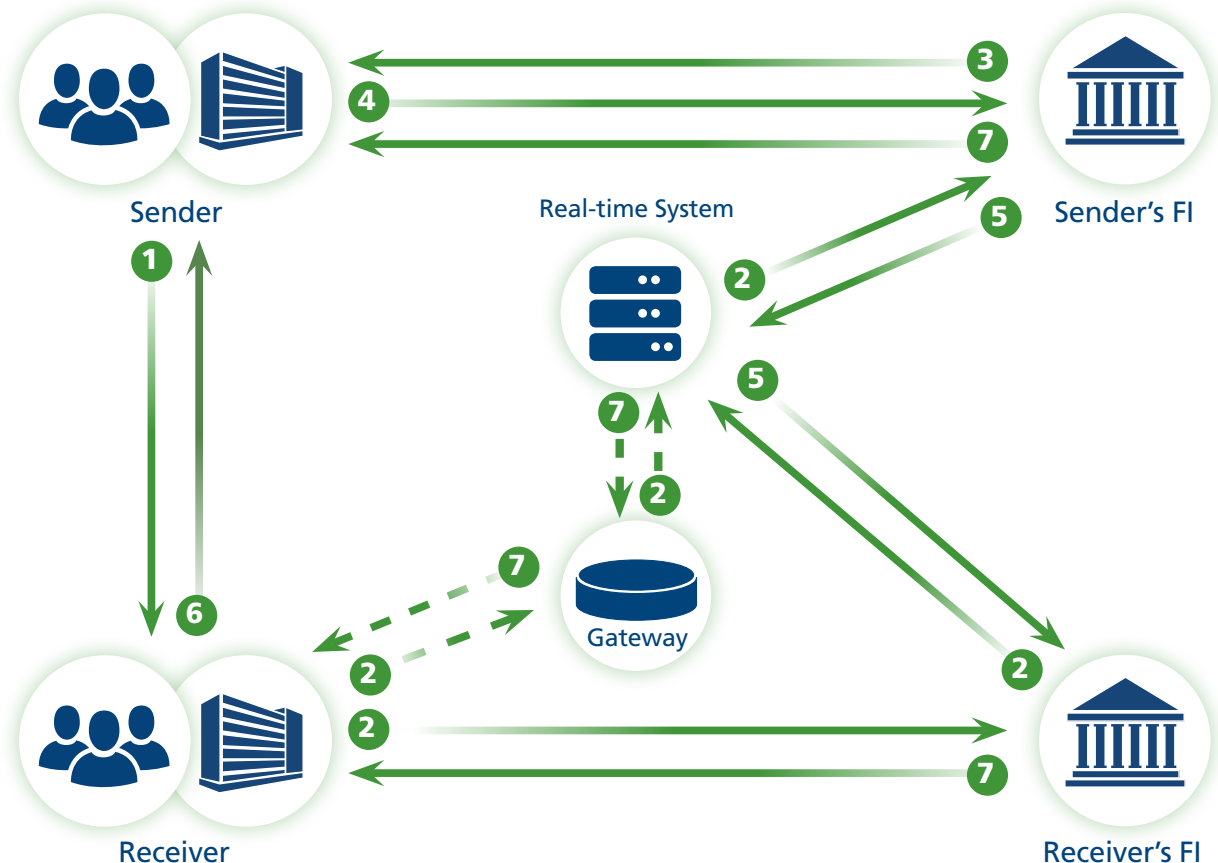
- 1) Sender logs into FI/Third Party, is authenticated (preferably using two-factor authentication), and provides payment instructions.
- 2) Sender's FI/Third Party validates message, checks for and secures sufficient funds, performs AML/CTF and KYC checks, and sends Payment Status Report notifying Sender if message is confirmed or rejected.
- 3) Sender's FI/Third Party sends credit notification message through real-time system to Receiver's FI.
- 4) Receiver's FI/Third Party passes credit notification message to Receiver (optionally, via a third-party gateway that can be used by a Sender or Receiver to connect to the real-time system instead of directly through their FI).

- 5) Receiver's FI sends message through the real-time system notifying Sender's FI that message is confirmed or rejected.
- 6) Sender's FI passes message to Sender that message is confirmed or rejected by Receiver's FI.
- 7) Sender's FI/Third Party debits Sender's account and sends debit notification message to Sender. Receiver's FI/Third Party credits Receiver's account and notifies Receiver of funds availability via credit notification reporting.

In this model, the sender receives real-time notifications from their financial institution/ third party that the payment instruction message was confirmed by their financial institution and by the receiver's financial institution, and that their account has been debited. Each of these notifications should include date and time stamp, as well as an identification number for the transaction assigned by sender's financial institution/third party. The receiver is provided real-time notifications of the payment, funds availability, and all available remittance information.

Real-time "request for credit" transaction flow

There is a second model for a real-time message flow, in which the business Receiver sends a request for credit to the Sender's financial institution or third party. This should not be confused with a classic direct debit ("pull" payment). In this case, the Receiver sends a request for credit ("push" payment) to the Sender's financial institution. The Sender's financial institution confirms with the Sender to see if they wish to make the payment, and if so, initiates payment instructions.



- 1) Sender logs into Receiver's website/portal, is authenticated, and selects Real-Time Payment method. (Note: this model could also start with Step 2, in which case the Receiver would not complete Step 6.)
- 2) Receiver sends Sender's FI/Third Party a request for credit message.
- 3) Sender's FI/Third Party notifies sender of request for credit.
- 4) Sender logs into FI/Third Party, is authenticated (using 2-factor authentication), and provides authorization to send credit.
- 5) FI/Third Party checks for and secures sufficient funds, and sends credit notification message thru the real-time system to Receiver and Receiver's FI notifying them that Sender is paying (optionally, via a third party gateway that can be used by a Sender or Receiver to connect to the real-time system instead of directly through their FI).
- 6) Receiver sends message to Sender thru website/portal that payment is confirmed and is posting.
- 7) Sender's FI/Third Party debits Sender's account and sends debit notification message to Sender. Receiver's FI/Third Party credits Receiver's account and notifies Receiver of funds availability via credit notification report.

In this model, the sender receives a real-time notification that the funds were withdrawn from their own financial institution, and confirmation from the business that their account was credited at the receiving business from the business. The receiver is provided real-time notifications of the payment, funds availability, and all available remittance information.

Exceptions

The diagrams above illustrate the flow of a real-time payment through a real-time system when everything goes perfectly. However, there are many possible exceptions that could occur throughout the process:

- The sender's payment instructions could be rejected by their financial institution/third party.
- The sender's payment instructions could be rejected by the receiver's financial institution/third party.
- If a receiving business is unable to post the payment to their customer's (Sender's) account, they would need to return the funds to the Sender.
- If a sender makes an error when authorizing a payment and sends an incorrect amount or makes a payment to an incorrect receiver, they will need a method to attempt to get the funds back from the receiver.