

Real time  
payments

## Real Time Payments 2.0

The next generation of  
real time payments: An  
international scan

time  
payments



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# Real Time Payments 2.0 – an international scan

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## 1.0 Executive Summary

Within the last five to ten years, around the globe instant or real time payments (RTP) have gathered significant momentum. While RTP has been around for over 40 years in various guises, there has been a vast increase in the number of countries and regions implementing it in recent years. There have been many drivers for this increase in adoption: regulatory mandate or regulatory pressure e.g. the European Union; a collective industry decision to innovate e.g. the US; or an upgrade in domestic Automated Clearing Systems that expose the need to develop further payment capabilities.

Due to this increase and RTP becoming the ‘new normal’ as predicted, industry dialogue around the globe has now shifted from discussing the business case and drivers for adoption to the opportunities and value-added services a real time payments solution can bring to the consumer and an economy at large.

While there is a keen interest to look at the new systems being built and the functionality that is being deployed, it is also important to understand the stance early-adopters are taking to ensure their systems keep up with modern demands. Rationalisation or decommissioning of existing infrastructure is a challenge many international jurisdictions will have to deal with as they embrace new technology, aim to reduce cost and remove system redundancy.

The field of payments is highly exposed to users, and the front-end is heavily influenced by the customer experience. This area is defining the payments’ evolution world-wide. With the reach of RTP continuing to increase, the opportunity for value added services also increases and as a result we are seeing many countries focus on new ways to initiate payments and what that means for authorization and identification. Open banking, QR codes at Point of Sale and usage of enhanced data are also being seen as imperative aspects of a modern payment system. However, with these new services come challenges in terms of standardisation, increased access to payment systems as well as ensuring ubiquity to the end user.

This paper explores key trends in the global real time payments market, presenting both the opportunities and challenges that may be relevant for the Australian market.

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## 2.0 Introduction

For the basis of this paper, the definition of real time payments given by the Euro Payments Retail Board, a division of the European Central Bank will be used:

*“electronic retail payment solutions available 24/7/365 and resulting in the immediate or close to immediate interbank clearing of the transaction and crediting of the payee’s account (within seconds of payment initiation), irrespective of the underlying payment instrument used (credit transfer, direct debit or payment card, electronic money) and of the underlying clearing and settlement arrangements that make this possible.”*

In the same way the industry expects each country to have a Real Time Gross Settlement (RTGS) system and Automated Clearing House (ACH), it will also be expected that each country will have a real time low value clearing system and, in due course, RTP with a range of value-added services. Global organisations such as the World Bank and the Bill and Melinda Gates Foundation are supporting the implementation of low-cost, real time payments systems in developing economies in Sub-Saharan Africa, the Pacific Islands and Central America and the Caribbean.

A variety of RTP systems have been implemented worldwide. Many of those that were considered early-adopters implemented ‘transactional’ real time payment systems, where the transaction is executed in real time. However, the operation of the system is often not 24/7/365, but limited to business hours as in the case of Brazil, and Nigeria. As newer systems are launched with increased functionality and enhanced flexibility, these early-adopters are beginning to look at whether their own RTP systems are fit for purpose in the digital age.

Since real time payments has become a central discussion within the payments industry, the focus has initially been on Person-to-Person (P2P) payments, as the use cases are more apparent. However, as banks and other payment service providers seek to maximise the investment they have made, other payment types are being considered as fertile ground for real time payments. There is a global trend to deeply embed payments into the social fabric of society, for consumers, SMEs, corporates and even governments.

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## 3.0 The evolution of access

As the proliferation of real time payments systems increases, regulators have placed significant emphasis on more open access to these systems to increase competition in the retail banking sector. Access to payment systems is vital for many organisations to be able to provide the payment services their customers need.

Traditionally payments systems have been accessed either directly or indirectly via a direct participant, typically a bank. This latter model is largely utilised by smaller institutions who may not have the necessary liquidity requirements to directly access the system or as is common in a real time payments system, do not have the IT infrastructure to support 24/7/365 payments.

New entrants to the banking sector, who often come from a technology orientated perspective rather than a financial one, have been increasingly competing for space in payments. Modern access arrangements to ensure these new entrants can compete on a level playing field are seen as vital to enhancing competition in retail banking as well as improving financial inclusion.

Regulators and market infrastructures are considering the type of access models for different organisational types, keeping in mind the importance of the need for prudential regulation, security and the smooth functioning of payment platforms and systems.

### 3.1 The UK

The UK's Faster Payments has implemented a Technical Aggregator Access model. This option enables a Payment Service Provider (PSP) to connect to Faster Payments via a Technical Aggregator which manages direct access into the system. Examples of Technical Aggregators providing these services include ACI Worldwide and Bottomline Technologies. A smaller financial institution or PSP can send payments into the Technical Aggregator who will then manage the payment flow within the system. One advantage of this model is that smaller challenger banks are not relying on their competitors to provide access services, as well as not requiring 24/7/365 IT systems. The more institutions that join an aggregator, the more extensive the economies of scale realised by each connecting institution.

In addition Faster Payments has also introduced 'pre-funding', guaranteeing settlement without the shared risk. The new system has removed the implicit obligation for smaller participants to underwrite a share of larger participants' transactions that existed as part of the previous liquidity and loss sharing model. The Bank of England has also relaxed requirements to own and operate a settlement account with the central bank, a pre-requisite for joining any of the other UK payment systems. This has allowed non-incumbent banks to also hold an account there, such as e-money institutions.

### **3.2 Singapore**

The Monetary Authority of Singapore (MAS) has formed a Direct FAST industry working group, which includes banks, non-banks, and MAS, to develop business and technical requirements for non-banks to connect directly to FAST. Taxi hailing app Grab, Liquid Group, MatchMove, Razer and TransferWise amongst others, have signed up for this working group.

MAS is also looking at, alongside the Singaporean government, parties interested in building and operating a FAST aggregator, which would help lower costs by bringing together the technical requirements for access across a number of players.

### **3.3 Malaysia**

PayNet, the retail payments operator in Malaysia implemented the first service on its new Retail Payments Platform (RPP), DuitNow in 2019. DuitNow is the nation's retail real time platform. To promote usage across Malaysia, the system can be accessed by both banks and non-banks. Within the non-bank category, this includes eligible issuers of E-Money; approved issuers of a Designated Payment Instrument; or registered Merchant Acquirers.

\*

Currently other markets including China and the European Union nations are all considering access arrangements to payment systems. India has often been looked at as a pioneer of open access to payment systems. When the Unified Payments Interface was implemented in 2010, it allowed third party developers to access it through APIs to support retail real time payments for an Indian consumer with an account at a participating bank. The access model of the UPI system has led to rapid uptake in usage; 235 million transactions were reported for the month of July 2018. Whilst UPI only allows PSPs to directly access the system, it openly publishes all APIs allowing third party providers to build value added services and connects multiple counterparties together in a secure and validated way. This combined with a digital identity system has truly revolutionised India's payments ecosystem and customer experience. UPI is considered one of the most innovative real time payments systems in the world.

Access to real time payments infrastructure, particularly for non-banks, is likely to remain a key area of focus for market infrastructure providers.

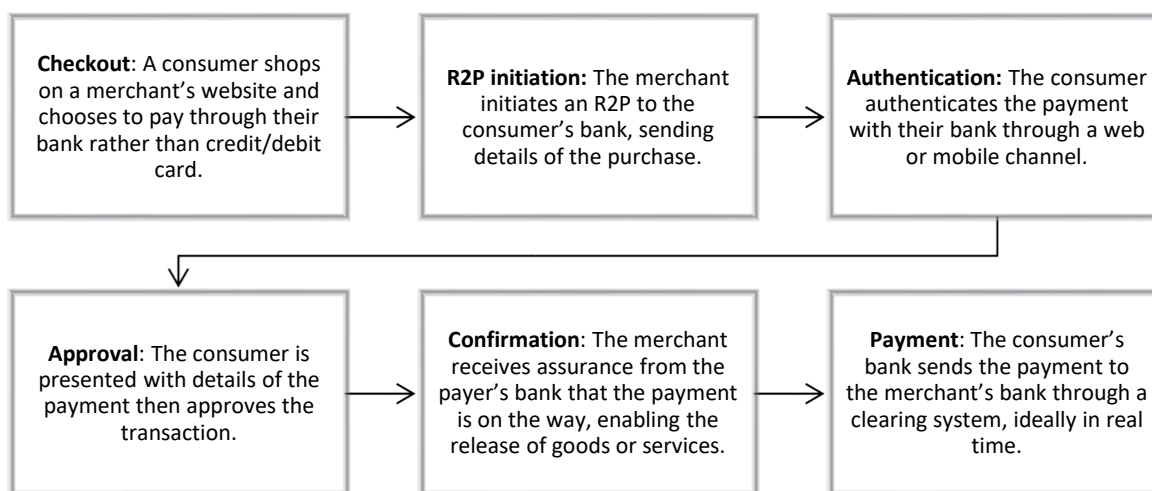
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## 4.0 The future of payment initiation

As consumers become more digitally savvy and require greater transparency over their financial portfolio, differing means of payment initiation are being investigated globally. Request for Payment (RfP) is fast becoming seen as an efficient digital method of payment and one in which is becoming a priority program for many infrastructures and payment service providers globally.

RfP is a collective term for systems that initiate payments from bank accounts. In contrast with Direct Debits, RfP is real time and suitable for single or ad hoc payments. They do not require an upfront mandate from the payer and enable the payer to approve and execute the requested payment in real time

*Example of RfP scenario:*



Source: Citibank

A well-established RfP example is the iDEAL scheme in the Netherlands. iDEAL payments are integrated in the online banking portal and mobile banking app of all relevant banks in the Netherlands, reaching over 90% of Dutch individuals. As an indication of how RfP can evolve, iDEAL is now moving into the POS space. In Thailand, the instant payments system PromptPay also has a RfP layer which is integrated into most merchant websites.

Other countries exploring RfP opportunities include:

**Hong Kong:** The Faster Payment System (FPS) was launched in September 2018. It is a multi-currency platform that will support both HKD and RMB. Banks and non-bank payment service providers can participate. Payments can be made through mobile phone numbers or email addresses as a proxy for bank details. FPS will provide real time credit transfers and RfP. To facilitate RTP at POS, the Hong Kong Monetary Authority (HKMA) is developing a common QR code standard.

**Malaysia:** Malaysia is a showcase of payment system innovation and is making a systematic push from paper to digital payments. The real time Retail Payments Platform (RPP) launched in 2019, with initial services being instant credits and RfP for ecommerce merchants, with payments approved through mobile banking applications. Although the service is called Real Time Debit, it is in fact a push, RfP payment.

**The UK:** A RfP service is under development in the UK and set to launch in 2019. It will be overlaid on top of existing payments infrastructure as a new flexible way to pay organisations and individuals.

**The US:** The Clearing House RfP platform incorporates RfP messaging specifications. Few banks have taken advantage of this as yet. Bank of New York Mellon was the first bank to switch on RfP functionality.

There are many use cases for RfP, but one of the most common is the payment of utility bills. Currently around the world, utility bills are paid by Direct Debit (if a DD system exists) or cash/card/bank transfer direct to the utility company. RfP can allow for the utility company to request a payment from the customer via their bank, potentially allowing for part payment or delayed payment based on the relationship with the customer. Unlike the 'blind' transaction of a Direct Debit, a RfP puts the customer in control of their funds, as they know when they are being paid and are being asked to pay, rather than the funds being debited automatically.

**Live RfP Use Case:**

UK bank NatWest recently announced that it has teamed up with British mobile phone retailer Carphone Warehouse to trial a new online shopping system that lets customers pay directly through their bank account, without using a debit or credit card. When checking out on the Carphone Warehouse site, shoppers are presented with a NatWest button that they can press to be taken to the bank's app, where they log in and complete the payment. NatWest says that the pilot has already proven a big hit with customers, cutting purchase times and ensuring that bank balances are accurate immediately. NatWest is the first UK bank to launch this payments service, leveraging Open Banking-compliant APIs and a direct connection to the UK's Faster Payments Service.

RfP can have a significant impact on the bottom-line of corporates. Delta Airlines estimates that it could make a saving of \$600 million a year if customers replaced credit card payments in favour of RfP.<sup>1</sup>

#### **4.1 Impact on Direct Debit**

Many real time payments markets are starting to move away from traditional debit style 'pull' payments, towards a 'push' payment type, or credit transfer. This allows the customer greater control over the timing, the amount and the regularity of payment. Direct Debit is still being used in countries where it is a common payment method, e.g. the UK, however the trend is for real time payment rails to support RfP as a viable alternative. The combination of RfP and the architecture created under Open Banking can flip the payment authorisation model used by direct debit, turning "pull" authorisation to "pushes" by consumers.

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<sup>1</sup> ACI Worldwide, 'Keeping pace with innovation in real-time payments'



This presents challenges in the context of decommissioning legacy infrastructure and how to handle direct debit payments. As yet it is unclear how infrastructures that support direct debit will move forward. In the case of the UK, it is likely that the current direct debit scheme will continue to exist, potentially as an overlay to the core infrastructure, rather than forming part of it.

As of yet, no nation has concrete plans to decommission their direct debit infrastructure. Hungary, who is due to launch their instant payments system in 2019 has stated that they may be introducing direct debit functionality within the instant payments system at a later date but it will not form part of the go-live system<sup>2</sup>. The majority of Hungarian banks deem the running of a parallel system acceptable to process corporate payments, batch payments and direct debits. The belief is that there would need to be a fundamental change to the business logic of the instant payments system to process direct debits, which is unfeasible. Banks are considering whether to process direct debits within their own internal systems.

One real time payments infrastructure that does allow pull payments is India's Unified Payments Platform (UPI). Amongst the set of APIs that are published to process payments, there is a **Collect Request**, where the customer can pull funds from the intended remitter by using a Virtual ID, as opposed to a **Pay Request**, where the initiating customer is pushing funds to the intended beneficiary. A Collect Request can be scheduled, however at the current time UPI does not provide for pre-authorization of a pull payment, therefore each Collect Request needs to be authorised individually. Whilst UPI has this functionality, the Reserve Bank of India still operates the Electronic Clearing Service for Direct Debits.

#### **4.2 The role of e-mandates for RfP**

An additional challenge presented by the move to RfP is that it removes the 'set it, forget it' model of direct debit, where consumers can set up a direct debit and future payments no longer need to be managed. All of the RfP projects outlined above require payment authorization by the customer for single, one-off transactions. If RfP is to take over direct debit as a payment method for regular payments, it will need to be considered how a mandate might be developed to allow a bank to 'push' payments to a supplier at regular intervals. An e-mandate solution could be beneficial here, for example if RfP was used in a taxi-hailing scenario, once the customer is requested to pay, the customer could select for all future taxi bills be paid in this way, thus creating the necessary mandate.

All other live RfP systems today operate on a continuous authorisation model, whereby customers must authorise every unique transaction. However, there are live Direct Debit systems that operate an e-mandate solution that may be able to be migrated to RfP. ISO 20022 has messages in its repository for e-mandates that could also be used.

Malaysia's PayNet, as part of their Direct Debit system, has a well-established e-mandate solution. Customers can grant authorization for Direct Debits by filling out an online form, allowing their bank accounts to be deducted for payments. Both merchants or customers can also terminate the recurring

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<sup>2</sup> The Central Bank of Hungary, 'Operational model of the instant payment service in Hungary'

mandate online. This e-mandate solution could be utilised for a RfP scenario, whereby a customer grants authority for push payments to a particular approved supplier. However, this has the potential to alter the model towards risk based authorisation, where the bank itself may need to assume the risk/liability in a taxi hailing scenario.

In India, NCPI (National Payments Corporation of India) operates a Mandate Management System (MMS). This system collects and stores mandates utilised for debit and credit transactions. Each mandate is uniquely identified by Unique Mandate Reference Number (UMRN) which makes tracking of multiple mandate details easier for customers. In 2018, India's UPI system has launched one-time mandate with block functionality. Consumers can pre-authorise a transaction and block the funds in their account for a debit to occur at a later date. UPI Mandate can be used in scenarios where money is to be paid out later after obtaining the service but the money is blocked on the account instantaneously. The mandate is digitally signed and stored at a customer's account holding bank and with their app providing bank.

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## 5.0 Additional capabilities

### 5.1 Enhanced Data

In the wake of global real time payments implementation, it is widely recognised that 'instant' is not necessarily the end game. The launch of a real time payments system allows for greater development of value added services to be built within or on top of the infrastructure to promote customer benefits. As the payments sector is rapidly evolving, data is becoming increasingly important. The way payments data is collected, used and shared presents opportunities for PSPs and end users. Regulators see enhanced data as having potential to create new business models and improve access for new entrants into the sector, stimulating competition and innovation. It could also enhance the detection of financial crime and strengthen protections for customers.

Payments data can be a mix of financial, transactional, behavioural and other types of data, which PSPs and other entities collect in the process of providing payment services. An enhanced data capability can enable recipients to see information relating to the purpose of the payment, tax and benefit information, a personalised message or underlying business transaction details. The feature can also provide a capability to link items to a payment. The challenge is not in the business case but how to apply it consistently and to monetise it.

One of the key drivers for instant payments and use of the ISO 20022 standard is the extended data carrying capabilities opened up by its implementation. ISO 20022 allows the potential for as much data to be included in the message, or supplementary data elements, as the implementing organisations will permit. It also allows for the transmission of images, invoices and more.

Whilst many payments infrastructures have either built enhanced data carrying capabilities into new systems, banks are still grappling with how to use it.

#### Challenges:

- Standardisation of data across the payments ecosystem - RTP systems are often built alongside existing legacy infrastructure. These rarely interoperate and as such neither does payments data across payment systems. Therefore, it can be a challenge for banks to formulate a consistent customer data proposition across multiple payment systems
- Lack of market practice on data expectations between banks e.g. how to handle unstructured data and special characters within data sets; storage duration; fraud and crime screening on extended data sets
- What type of data should be permitted to be passed through the payment system and is there any data that needs to be de/re-coupled e.g. non-payment related data
- How to utilise and monetise data once collected
- Governance of data – how is it collected and by whom

To date, this has led to very few real examples of tangible extended data usage provided by new payments infrastructure, by banks. International standards groups such as the ISO 20022 Real Time Payments Group has published best practice guidelines on how much data should be passed through a real time payments system, but further market practice should be developed within each jurisdiction.

Detailed data analytics was once the domain of giant tech companies but for banks to truly take advantage of Open Banking and real time payments they too will need a technology stack for data management, reporting advanced analytics and additional future Big Data use-cases. Banks need a data stack that is flexible but that can host, process and visualise high volumes of data, rapidly.

Central infrastructure potentially has a role to play in two ways:

- (i) Assist the industry in developing a payments data strategy
- (ii) Operational responsibility for a collective payments industry data environment

The UK, as part of its NPA program is in the process of developing a pan-industry ecosystem for 'Enhanced Data' that will rely on a series of actors namely 'Repository Providers', 'Retrieval Providers' and 'Directory Services' that will all have varying obligations including storing the data as well as providing it to payees. Additionally, the UK is attempting to solve the problem of data interoperability ahead of the launch of NPA by ensuring that there is a consistent ISO 20022 credit transfer message set for all electronic payment types in the UK, both high and low value, that can be consistently mapped to and from legacy formats. This will ensure interoperability both of the payment itself but also the data.

#### **Visa Extended Data Example:**

Visa was the first card network to enable its UK commercial account holders with a comprehensive view of their Amazon Business purchases. The enhanced transaction data, available to Barclaycard, Citi, HSBC, and Lloyds Bank U.K. commercial account holders, provides line-item details on all purchases for Amazon Business customers and seamlessly integrates with reconciliation tools.

**ISO 20022 Enhanced Data in Use:**

The Federation of Finnish Financial Services defined ISO 20022 Tax Report message descriptions. The message enables transmission to the tax authorities of VAT data collected from the data contents of electronic invoices (that also utilise ISO 20022). The data contents of electronic invoices can also be used in combating the grey economy. For example, the construction sector has defined a common identifier for new building contracts. The identifier is indicated on the ISO 20022 electronic invoice, meaning that the party who has ordered the contract work can report the contract prices, specified by agreement and construction site, to the tax authorities. Such a report can also be compiled automatically on the basis of electronic invoice data.

Additionally, in Finland all SMEs have a payment account from which electronic account statements can be obtained. Electronic invoice data can be linked with electronic ISO 20022 account statements and other account transactions, making it possible to automatically compile an SME's or other organisation's accounting data.

Other types of organisations have been quicker to tap into the opportunity data brings. Money Dashboard use payments data to provide insights on their customers' spending habits. Google Pay collects data (e.g. transaction and account data) from users to facilitate the provision of advertising. In turn, advertising helps to keep the service free for users. We will no doubt see the proliferation of payments data being used to benefit the consumer by digital banks who have built their technology stack with data as a central facet.

In Europe, whilst PSD2 emphasizes data sharing with PSPs and Third Party Providers (TPPs), the GDPR proposes to protect personally identifiable information (PII) from TPPs. Further, on data control, GDPR requires customer consent for processing data while PSD2 requires it for sharing with other institutions.

Regulatory intervention to solve anomalies and inconsistencies is required to ensure safe and effective collection and usage of customer data. Other jurisdictions who are also implementing open banking or open data need to consider these implications.

**5.2 Certainty of payment**

Increasingly markets are putting in place various solutions to ensure certainty of payment:

In the UK, the payments industry is implementing a Confirmation of Payee (CoP) service, giving end users of payment systems greater assurance that they are sending their payments to the intended recipient. It is, in essence, an 'account name checking service' that can help avoid payments being misdirected due to errors. It can also address certain types of Authorised Push Payment (APP) fraud, by introducing another hurdle for fraudsters and giving effective warnings to customers about the risks of sending to an account where the name did not match.

In the US, The Clearing House RTP system incorporates 'Request for Information' messaging, which allows real-time information exchange between biller and payer, similar to text messages.

On SWIFT's gpi platform, end-to-end payments tracking has been introduced. Often termed the 'FedEx' approach, SWIFT gpi banks are able to instantly check the status of the payments sent, in progress and received. As customer's expect greater transparency when they send a payment it is expected that at a national level payments industries will start to launch similar offerings.

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## 6.0 Open Banking and APIs

Instant payments and Open Banking are both high on the agenda of regulators, financial institutions, market infrastructures and fintechs. Both of these developments are significant in their own right, but the confluence of the two will usher in an era of real time commerce that will unlock a host of new opportunities and value propositions for banks and their customers.

By enhancing transparency and the instantaneous exchange of information, the combination of the data-sharing requirements of Open Banking and real time value and data transfers real time payments brings will enable suppliers and consumers to more efficiently manage functions like liquidity, treasury and cash flows. For banks, there is huge potential to leverage the commercial capabilities created by Open Banking and real time payments, either by creating new products or by collaborating with third parties to develop innovations out of a wealth of new data resources.

The industry worldwide is consolidating around the use of Application Programming Interfaces (APIs) based on JSON and REST, to deliver Open Banking requirements and banks need to ensure they are well-architected for the API economy. This is not only for compliance, but also for the ability to expose further value-added services from partners to end customers.

Some banks, such as Citibank, have openly embraced APIs and made them an integral part of the strategy:

### **Citibank embraces APIs:**

Citi has pledged to put APIs at the front of their digital strategy and has opened up a whole host of APIs to third party developers. The bank has already put them to work across the banking group and around the world to benefit their customers. For example, Citi China customers can apply for a credit card, inquire on their application status, activate the account, access their account balance, request a credit line increase, obtain an instant loan on their phone and an equal payment plan, all through WeChat.

A number of countries, including India, Japan, Singapore, and South Korea, do not currently have formal or compulsory Open Banking regulations, but policy makers are introducing a range of measures to promote and accelerate the take-up of data sharing frameworks in banking. In Singapore, MAS and The Association of Banks have published an API Playbook to support data exchange and communication between banks and FinTechs. In Japan, the FSA has established an authorisation process for TPPs and introduced an obligation

for banks to publish their Open API policies, and encouraged banks to contract with at least one TPP by 2020.

Outside the EU, there are two large scale mandated Open Banking programs:

- The Hong Kong Monetary Authority issued an Open API Framework in July 2018, setting out a four-phase approach for banks to implement Open APIs, starting with information sharing on products and services, and ending with sharing of transactional information and payment initiation services. Contrary to the EU approach however, while banks will be required to develop APIs, they will be able to restrict access to those TPPs with which they choose to collaborate.
- The second being Australia. Australia has been a vanguard in the push for Open Data rather than Open Banking via the Consumer Data Right. The Australian authorities have taken a holistic approach to data focusing on the customer's need, regardless of industry.

Whilst the banking sector and payments in particular are the first industry to implement open data around the world, it is expected that other industries like telecommunications and utilities will be asked to expose data in the same way as financial services, much like the Australian model.

The airline industry has been a front-runner in adopting new payments technology and the combination of Open Banking and Instant Payments has allowed partnerships such as the International Air Transport Association (IATA), ipagoo and Deutsche Bank example:

**New Payment Method for The International Air Transport Association (IATA):**

IATA announced in 2019 the successful completion of the first "IATA Pay" ticket purchase transaction in a live test environment. The transaction was conducted in partnership with ipagoo, a UK-based fintech company. IATA Pay is an industry-supported initiative to develop a new payment option for consumers when purchasing a ticket directly from an airline website from their bank account. It is made possible by PSD2 and the UK's Open Banking regulation.

The live test conducted with ipagoo was done under the UK's Open Banking framework with IATA Pay pilot airlines, including Cathay Pacific Airways, Scandinavian Airlines and Emirates.

Many open banking initiatives are starting with read-only access, where third parties are only able to view relatively static data such as account product information. This will have little impact on RTP infrastructure per se. However, write-access such as payment initiation will likely have an impact on RTP systems. RTP systems will need to be ready to adapt to this change. Payment Initiation Services are still relatively new and adoption of this is likely to come once consumers have started to use data-sharing services in a more meaningful way. At present, in the UK a payment initiation API sent to a directly connected bank will be converted into an ISO 8583 message to be sent to the Central Infrastructure. In time, the infrastructure itself may wish to accept APIs for payment execution, such as in India. The global need for ISO 20022 to work in an API context has led to international collaboration in this regard. ISO 20022 best practice for APIs

has been published and further work is being undertaken to better understand how ISO 20022 can be implemented in the JSON syntax (commonly used for API exchange). This will not only encourage greater use of the standard in Open Banking and APIs and will better facilitate the integration of APIs by real time payments infrastructures globally.

## 6.1 APIs for payment initiation

**Europe:** PSD2 brings a new actor into the payments ecosystem, a Payment Initiation Service Provider (PISP). This actor can initiate payments on the customers behalf to the bank, who will then execute the payment with the central infrastructure. The PISP will initiate the payment with the bank via an API. There are currently six or seven different API standards as well as several national standards—but around 78% of EU countries will use the Berlin Group's NextGenPSD2 specification. However, NextGenPSD2 allows for differing interpretations meaning that it will not totally remove fragmentation from the market. There is no mandate to use any specific set of APIs. Only the requirements of the national competent authorities (NCAs) of the EU member states are binding, therefore the Berlin Group specifications can only be 'recommended' by industry unless they come legally into force.

The latest version of the NextGenPSD2 specification allows the submission of a single payment in JSON, as well as multiple payments in one single bulk submission by applying Secure Customer Authentication once for all transactions. With the implementation of the pan-European SEPAInst system, PISP executed payments are likely to be made in real time, if the bank is offering RTP.

Due to UK Open Banking and PSD2, Europe has seen a surge in API gateway and API management technology products to assist banks in delivery of these services.

**The UK:** In the UK, the Competition and Markets Authority Open Banking Order requires the nine banks mandated to deliver open banking to be aligned with the Regulatory and Technical Standards (RTS) under PSD2. The Regulatory Technical Standards for PSD2 required that the interface "shall use ISO 20022 elements, components or approved message definitions". In keeping with that requirement, the API payloads are designed using the ISO 20022 message elements and components where available. As such an ISO 20022 compliant set of payment message APIs has been developed, that can be mapped to the technical specifications of Faster Payments and Bacs, including payment initiation. Whilst the domestic UK payments systems are not ISO 20022 native, the expectation is that this mapping will formulate part of the migration plan to ISO 20022. Within the payment flow, the PISP connects to the Account Servicing institution that services the customer's payment account and creates a payment order consent. This informs the customer's institution that one of its customers intends to make a payment-order. The customer's institution then responds with an identifier for the payment-order consent resource and the PISP requests the customer to authorise the consent. The customer's institution will store the consent based on their own policies. However, there is no need to send the consent to the beneficiary bank as per Faster Payments and Bacs current operating procedures.

**Singapore:**

The Monetary Authority of Singapore does not have a standardised set of payment APIs but publishes Transaction APIs to enable payments, funds transfers, settlements, clearing, trade confirmations and trading from banks who currently implement APIs for these services. These include Citi, OCBC and DBS.

**India:**

The real time platform in India has seen a significant rise in volume since the launch of the Unified Payment Interface (UPI) over its Immediate Payment Service (IMPS) infrastructure. UPI enables all bank account holders in India to send and receive money instantly from their smartphones without the need to enter bank account information or net banking userid/ password. To use UPI, users need to create a Virtual Payment Address (VPA) of their choice and link it to any bank account. The VPA acts as their financial address and users need not remember beneficiary account number, IFSC codes or net banking user id/password for sending or receiving money. UPI can be used for Peer-Peer, Peer-Merchant & Business-Business payment transactions.

The service is imbedded in many third party apps e.g. Amazon Pay, Uber India and Whats App, as well as a payment method on most retail sites. APIs for a range of payment scenarios are published and there is a fintech sandbox for participants to use.

There are a variety of standards groups developing best practice and standards for APIs in payments including Afinis and ISO. The trend towards standardisation of APIs both within markets and globally is likely to continue.

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## 7.0 QR Codes and their usage

Globally, banks and non-banks are testing whether Quick Response (QR) codes to merchants and consumers can provide a simple solution for payments. With a much richer history of mobile payment methods the Asian continent is really leading the charge in this space. A QR code is a two-dimensional code made up of black and white squares that can be read by smartphone cameras, point of sale (POS) terminals or other devices.

### 7.1 Asia leading the QR Revolution

While QR codes have been used for payments in Asia for nearly a decade, they began to be used much more for payments when WeChat and Alipay in China started offering proprietary versions in late 2011. QR Codes in Asia have not always been a success. In 2014 fraudulent QR codes caused the Chinese government to ban QR code payments temporarily, but WeChat and Alipay strengthened their controls and QR code payments have continued to gain traction.



However, after usage of fraudulent QR codes that infected smartphones with viruses led to theft totalling \$13 million in early 2017, for instance, the security of QR codes started coming under fresh scrutiny and may be slightly attributable to its slow uptake and reticence in other parts of the world.

Thailand, India, China, Singapore and Hong Kong have established payment services based on QR codes that use real time payment mechanisms. The use of QR codes has been pioneered with small retailers and service providers, such as street food vendors and motorbike taxis, who do not normally offer electronic payment options. QR codes are also used in Thailand by the Healthcare industry, hospitals such as Samitivej hospital in Bangkok has implemented Samitivej FASTPAY, their own QR based-solution, in conjunction with SCB bank, that allows patients to pay via QR code that utilises the real time rails.

QR codes have also become a government-endorsed solution to reducing cash reliance and reducing the underground economy.

QR codes are seeing rising popularity in Southeast Asia because it is relatively cheap and easy to adopt compared to NFC-based Apple Pay, Android Pay or Samsung Pay. Plus it does not require an internet connection to work. In 2019, ASEAN countries also pledged to create a standard QR code to facilitate regional transactions.

## **7.2 Card scheme usage of QR Codes**

The global card schemes have been integral in promoting the usage of QR codes. In 2016, Visa launched a mobile payments application in Kenya as a challenge to incumbent M-PESA. In partnership with four large banks, it launched mVisa to enable consumers to make payments by scanning a merchant's QR code. Visa then began expanding the service, announcing in February 2017 that mVisa was live in India, Kenya and Rwanda and would soon be available in Egypt, Ghana, Indonesia, Kazakhstan, Nigeria, Pakistan and Vietnam. MasterCard rolled out Masterpass QR in Nigeria, Ghana, Rwanda, Uganda and Tanzania, and said it would "soon be in a number of countries across the continent".

## **7.3 Banks and QR Codes**

Banks were largely left out of QR code payments in China, focusing instead on NFC payments such as Apple Pay or Mi Pay that are usable at traditional POS terminals. However, UnionPay launched QuickPass QR payments in May 2017 in China and soon extended the service to Hong Kong and Singapore. It is important to note that these offerings are largely proprietary systems and are not interoperable.

Banks and regional financial institutions across Japan expect to come out with a unified smartphone payment service in 2020. The envisioned service will allow account holders to pay merchants by showing QR codes that will appear on their smartphones. Payment amounts will then be debited from the buyer's bank account. The new service will be an extension of existing debit card services, with an app replacing the physical cards. By making use of the existing system, the industry will be able to reduce costs that go along with introducing a service. The banks also believe this approach will allow many institutions to join.

The banks also want to allow account holders to use the service when shopping online or paying utility bills and taxes. In Japan, many consumers allow utilities to directly debit their bank or credit card accounts every month, and local taxes can be paid at the post office.

#### **7.4 QR Codes outside of Asia**

Unlike Asia, Europe and the US have been slow to adopt QR codes as a payment method. Mobile payments in general have been relatively unsuccessful thus far. There are many successful examples of QR code usage at a country level but they are struggling to scale up, mainly due to a lack of standardisation.

NFC remains the point of sale master with merchants preferring the convenient, quick response and easily changeable function while customers prefer the convenient 'tap'. The challenge with NFC is that it is dominated by the big processor schemes, namely MDES (Mastercard Digital Enablement Service) and VISA's Token System (VTS).

QR codes are unrestrained by such schemes, and instead lend themselves to the European Payment's Council's (EPC) SEPA Instant Credit Transfer (SCT Inst) which can transfer money of up to €15,000 in less than 10 seconds.

Leading smart payment providers from Norway and Finland will launch Europe's first joint QR code payment scheme in 2019 using the standard of China's mobile and online payment service Alipay. With the rise of Open Banking and the European Central Bank's desire to break up the duopoly of MasterCard and Visa in Europe, it is likely we will start to see a rise in a QR option at Point of Sale in the region.

QR codes have been imbedded in the payments and invoicing process in countries such as Czech Republic for many years. However, other nations are also starting to embrace this technology as an alternative to paper invoicing. In Europe, the European Payments Council has launched a pan-European QR standard to promote ubiquitous usage of QR codes across the region. The standard European QR code contains all the data related to the invoice. A payee scans the QR code on an electronic or paper bill, confirms the payment information and pays for their goods. Large banks in Austria, Belgium, Finland, Germany and The Netherlands have been quick to launch the technology.

In Sweden, Swish, the real time mobile payments platform has also enabled QR code payments, both in-app for invoice payment as well as at-terminal payments for store payments.

#### **QR Code use case: Food business**

A gourmet sandwich shop called Split Breadis in San Francisco offers a QR payment method. Each table has a metal stripe with a QR code printed on it. Patrons sit down and scan the QR code with their smartphones to pull-up the digital menu. Customers place their order without ever speaking to a real person. When their order is ready, they pick it up at the counter. Approximately 30% of customers pay using this method.

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## 8.0 Opportunities brought about by real time payments

### 8.1 Retail and E-commerce

Card payments both online and at a Point of Sale have dominated payments for decades. However, the plastic card has had its functionality stretched more than was ever conceived. In the modern era, where cyber security is a high priority for all financial industry players, real time payments provides an alternative.

- Three-quarters of a trillion Euros in annual retail expenditure is set to switch to Instant Payments across Europe by the end of 2027.
- Single-transaction card payments (in which the customer enters their card PAN and other information for each transaction) will drop from a 40% online market share to 11% in the next 10 years.
- Instant Payments will grow particularly strongly in e-commerce, reaching €338bn of online expenditure by the end of 2027.

Source: Ovum 'Instant Payments and the Post-PSD2 Landscape'

Merchants face strong cost incentives to move to accepting real time payments over payment cards and digital wallets (such as PayPal), particularly in e-commerce. Receiving cleared funds would mean they would be able to reduce chargeback costs where volume moves away from card-not-present (CNP) transactions. The faster receipt of payment will also have cash management benefits, potentially improving liquidity and reducing reliance upon revolving credit facilities. Similarly, transaction costs for any merchant who chose to become a PISP or accept real time payments via an intermediary would be highly likely to be lower than the current costs of card acceptance.

However, most consumers do not care how they make a transaction, as the payment is the final step to overcome to complete the purchase. Convenience and speed to complete the payment are the chief considerations, with incentives likely to become an increasingly important part of the mix when it comes to RTP. As a result, the use of credit cards – particularly where merchants are using tokenized credentials – and digital wallets will remain important fixtures of the retail payment landscape for some time to come, despite what is likely to be growth in the use of RTP.

One example of instant payments being used at POS is JPMorgan Chase's partnership with TouchBistro. The collaboration will now offer instant payment processing and mobile payment devices powered by Chase to offer table-side paying. Chase will also be promoting the service to the four million restaurant operators and small business owners in the Chase network. TouchBistro customers will be able to process payments instantly through the Chase WePay service.

Real time payments, in combination with Open Banking, has the capability to disrupt the card-dominated POS experience as well as provide alternatives to online card payments. PromptPay in Thailand and DuitNow in Malaysia amongst others, are real time payment options that feature on a merchant's website.

## **8.2 Social media integration**

Social media networks are expanding their reach to include payment solutions such as P2P money transfers or paying directly within the network.

Asian social media giant WeChat implemented WeChat Pay, a payment feature integrated into the WeChat app. It is one of the leading mobile payments solutions in China and actively used by 900 million users every month. Users can complete payments quickly with their smartphones. WeChat has Quick Pay, QR Code Payments, In-App Web-Based Payments, and Native In-App Payments, all to fulfil the full range of scenarios customers expect to fulfil and fully supported by most Chinese retailers. At the end of every transaction, a confirmation is automatically sent both to the merchant and the customer by the system. As of Q3 2018, WeChat Pay had 84.3% market share in the third-party mobile payments sector in China. WeChat Pay supports credit or debit cards or a Chinese bank account (for real-time payments as well as to wallet top-ups).

The online payment industry in China will become more regulated as the People's Bank of China has mandated third-party payment institutions, including Alipay and WeChat, to connect to a newly established unified platform from June 30, 2018. This new clearing platform is called NetLink or China Nets Union Clearing Corporation (NUCC). Payments will now need to be processed on this platform to better monitor fraud and money-laundering.

Instagram launched in-app Instagram Checkout in 2019. To use Checkout, an Instagram member stores a credit card or PayPal data (can be bank account information) and a shipping address within Checkout. The app also lets shoppers initiate returns, cancel orders and get shopping support. Instagram has become important to retailers and offering native checkout makes the mobile buying experience seamless.

Pinterest is utilizing "Action buttons" within their platform to allow users to add items to their Amazon Wish List or to complete a purchase directly from within the Pinterest site. With Amazon set to take advantage of instant payments and PSD2 in Europe, it is likely that account-to-account payments will be offered through this solution.

UK bank First Direct has launched its Fdpay service to let customers make P2P payments within social media apps. Customers can use the in-app PayKey technology to tap a payment icon on the phone's keyboard within a conversation and manage a payment without having to open the app. Until now, making payments required its customers to launch their app or login to online banking and enter the details to complete the payment. Fdpay is available in WhatsApp, Messenger or any other messaging app where the phone's keyboard is used. Real time payments up to £350 a day are possible using this service.

## **8.3 Government payments**

From a policy perspective it is clear why governments around the world are supportive of digital and in particular real time payments. Lower cash usage means a reduced underground economy. All workers,

including gig workers, can be paid digitally. This increases the amount of accounted for capital in the marketplace, improves tax revenue and strengthens financial stability. However, governments in their own right are large users of payment systems; whether 'paying away' in welfare payments or 'paying in' in tax payments. Real time payments has the potential to have a powerful effect on governments.

The challenge for government's is that there is a lack of a holistic digital strategy across all large departments who may use the domestic or international payment systems. Government's requirements of the payment systems is discussed largely in siloes, if at all. However, a government implementation of real time payments both could see volume increase dramatically.

#### **Cashless society: Sweden**

Sweden is expected to become a cashless society by 2023. 80% of all transactions are made by cards. Digital payments via card or apps are so widely accepted that many Swedes no longer carry cash. Sweden launched Swish, the nation's mobile RTP solution in 2012. The service works through a smartphone app, where the user's phone number is connected to their bank account. When the payment has been approved with Mobile BankID, the recipient has the money in their account in a few seconds. Customers pay via a QR code terminal and their Swish app in all stores across Sweden. The push towards a cashless society is driven by the Swedish government.

In 2010, the state of Arkansas in the US became the first state to offer secure mobile payment processing specifically for smartphone users of e-government services. People can use their smartphones for three high-volume online government services: inmate trust account deposits; probation and parole supervision and restitution payments; and property tax payments. With the implementation of RTP in the US, this could see the state of Arkansas implement instant payments in this regard.

Real time payments are also seen as important when dealing with emergency payments, e.g. a humanitarian crisis. Australia was one of the first countries to utilise their national real time payments infrastructure to this effect when welfare agency Centrelink made payments to clients through the New Payments Platform, with the system distributing \$2.2 million in Australian Government Disaster Recovery Payments (AGDRP) during the Townsville floods.

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## 9.0 Promoting corporate real time payments

Many SME's and larger corporates are still lagging in operating instantly. Low payment limits in certain markets have made the business proposition unattractive for large corporates. However, there is little doubt that over time real time payments will also become the new normal in this space. The potential value of instant payments for corporate customers is large, as they can benefit in multiple ways by instant incoming and outgoing payments. As such, financial service providers have a window of opportunity to unlock this value by creating new services on top of the real time infrastructure.

The ability to send and receive payments instantly allows corporates to interact with their customers in a different way. For example, insurance and reimbursement claims to customers can be settled in real-time, providing corporates with an instant service level to improve customer experience. On the other side, corporates can offer their customers 'just-in-time' payments. Customers can pay at the latest moment with instant confirmation of successful payment. This new way of interactions with customers can improve customer service.

Real time payments also enables corporate customers in different segments to realise operational efficiencies. Drop shipping business models (e.g. direct delivery from the supplier) are further supported by real time payments, as merchants can directly forward the customer payment to the supplier along with the order and have goods directly delivered to the customer. The need for holding inventory is therefore reduced.

For merchants, different over-the-counter (OTC) payment methods can be enabled by value-added services on top of real time payments. Facilitating instant credit transfers between merchants and their customers can potentially eliminate the need for third parties (e.g. card schemes). This leads to operational and cost efficiencies for merchants.

In a 2017 SWIFT survey, 42% of corporates were listed as looking for instant payments<sup>3</sup>, so the demand is starting to increase. However, other innovations were considered more beneficial e.g. real time tracking of payments and enhanced data.

ISO 20022 data carrying capabilities allow corporates to attach invoice data to a payment allowing for more efficient reconciliation. Corporates, particularly in Central and Northern Europe, are extremely familiar with using and managing ISO 20022 messages. In Switzerland, corporates were mandated to utilise ISO 20022 payment initiation messages as of 2018. Banks must also ensure that they can offer their corporate customers end-of-day account statements based on ISO 20022.

As real time payments include 24/7/365 availability of clearing and settlement, there is no naturally defined cut-off time for making end of day statements. Corporate customers therefore need to redefine their internal procedures for managing cash positions. Also, as incoming payments may take place beyond office hours, corporate customers will need to update their operating capabilities to predict future cash flows in order to optimally manage financial positions overnight and during weekends and holidays. With adequate tools and services, treasury departments can benefit from the reduced need for operating loans or lines of credit, as payments are not only received faster, but 24/7/365.

To assist with corporate uptake, Faster Payments in the UK increased the transaction limit to £250,000. This combined with the Direct Corporate Access that certain banks provide to their clients, companies can streamline payment processing for a range of transaction types such as urgent but low-value payments, 'just-in-time' supplier payments, direct remittances, refunds (thus replacing cheques), cash management

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<sup>3</sup> SWIFT, 'The future of payments, a corporate treasury perspective'

payments, weekly payroll runs and staff expenses. However, DCA uses the existing Bacs-style 'Standard 18', allowing only 18 characters of remittance, meaning the benefits of an extended data ISO 20022 based system are lost.

Singapore's FAST system has also increased its transaction limit to SGD\$200,000 and implemented PayNow Corporate. PayNow is a P2P platform for retail customers that has been extended to corporates, businesses, Singapore Government agencies, associations and societies. PayNow Corporate enables Entities to pay and receive Singapore Dollar funds instantaneously by linking their Unique Entity Number (UEN) issued in Singapore to their Singapore bank account. They do not need to know the bank and account number of other entities when transferring funds. The combination of these two additions are expected to increase corporate volume across the FAST system.

Elsewhere globally, corporate usage of real time payments is seemingly being driven at a bank level. HSBC Thailand has launched Corporate PromptPay. PromptPay is the national Thai instant payments system. Corporate PromptPay allows HSBC corporate customers to receive real-time fund transfers and real-time bill payments from its payers, helping to improve account receivables management and working capital. Corporate customers can link their corporate tax ID with a current or savings account in Thai baht (THB) at HSBC to receive domestic real-time fund transfers in THB. In Vietnam, Citi has partnered with Payoo to offer the bank's corporate clients in Vietnam the ability to receive real-time payments from their customers for services including utilities, telecommunications and credit card bills through Payoo's digital and physical network. In the US, PNC bank integrated RTP credits into all Treasury Management Receivables reporting services and RTP origination has been made available via PINACLE®, the bank's corporate online and mobile banking portal, as well as direct transmission and via API.

Swedish bank, SEB, supports both C2B and B2C channels through ISO 20022. SEB supports and encourages smaller corporates, with smaller volumes to use SEB's online banking tool with manual ISO 20022 file uploads. Larger corporates tend to submit via secure host-to-host connection integration. SEB alongside many other global banks engage in the international Common Global Implementation Group, which seeks to harmonise corporate use of ISO 20022. Large corporates such as General Electric and Ikea participate alongside financial institutions from all over the globe to set best practice for using ISO 20022 in the corporate space.

A comprehensive and strategic approach is needed to support growth of real time payments in the corporate sector. Corporate users have the potential to significantly drive volume through the system. In cases such as India, large transaction volume comes from the B2B space, for example Walmart activated UPI on its B2B e-commerce site. However, unlike retail customers, corporate users require a deeper understanding of the benefits for adoption, to make the necessary investment. This is largely driven by the relationship with their bank but the industry more widely has a critical role to play.

#### Education strategy for businesses and the public on real time payments

- Media and education strategy for business and the public on real time payments, e.g via both the banks and infrastructure

#### Understand impact & opportunity

- Understanding of technical and operational impact of 24/7/365 payments for corporates & SMEs
- Appropriate management & forecasting tools for corporates to operate real time cash management and liquidity
- Need to frame opportunity beyond 'instant' - enhanced data and real time liquidity are potentially much more valuable to corporates

#### Build a Payments Technology Community

- Develop a vibrant payments community, including fintechs to work together on innovative services, including translation engines that still allow for batch payment submission

#### Standardisation

- QR code standardisation
- API standardisation
- Data standardisation across the whole payments landscape, for all payments methods and scenarios so as to maximise data collection

#### Government as a payments user

- Comprehensive government digital strategy, with input from payments industry

The combination of these factors will greatly assist in uptake amongst the corporate community.

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## 10.0 Rationalisation of existing payment systems

The payments industry has grown increasingly complex and fragmented. Over its lifespan, differing and sometimes competing central infrastructures have mushroomed. Financial institutions are feeling the pressures of rising payment volumes and tougher customer demands, a challenge made even greater with outdated legacy systems that often work in isolation from each other. Key examples of this are the United States, with multiple competing infrastructures that are not interoperable and serve oftentimes differing customer bases. Additionally, the UK is making attempts to rationalise their low value payment systems (Faster Payments, Bacs and Cheque and Credit Clearing).

In their 2018 Payments Report CapGemini noted that, “the emergence of instant payments offers the opportunity for market infrastructure rationalization, which will help to simplify back-end processing and allow payment processors to focus resources on front-end activities that can enhance value offerings to clients”. But which nations are actively attempting to rationalise infrastructure?

There is no doubt that payments infrastructure rationalisation is the end goal. As RTP systems are built, one of the key strategic steps is understanding how this new system will interact with legacy systems, as well as if and how payments volume is expected to migrate to the RTP system over time. Additions to RTP solutions such as future dated payments and image carrying capabilities can still allow for longer transaction cycles and cheque clearing that has otherwise been served by legacy batch systems.



Whilst within Financial Institutions, we are seeing differing ways to tackle this problem, from modular payments implementation to a 'Payments Hub', at the central infrastructure level there has been no single way for central infrastructure providers to tackle this problem and different markets are looking to adopt different approaches:

Country	Rationalisation approach
<p><b>The United Kingdom</b></p>	<p>New Payments Architecture model is attempting to rationalise firstly from a governance perspective, then from an operational one;</p> <p>3 retail payments systems: Bacs (Low Value, 3 day transaction cycle), Faster Payments (RTP) and Cheque and Credit Clearing (image based cheque clearing) have all been consolidated into one company, Pay.UK;</p> <p>Premise is to implement a new system that will combine all of the capabilities of these three systems into one core retail payments system in the UK.</p>
<p><b>Canada</b></p>	<p>Payments Canada has introduced a roadmap for its modernisation initiative and the development of a Canadian Payments Ecosystem;</p> <p>Targets include setting up Lynx, a core clearing and settlement mechanism (CSM) for large-value payments and settlement optimization engine (SOE) for retail batch transactions;</p> <p>Plans also to implement real-time rails (RTR) to institute rail-agnostic domestic payments that offer simplified payments and a richer set of viable payment options.</p>
<p><b>The United States</b></p>	<p>The United States' Federal Reserve has formed a Faster Payments task force to oversee payments infrastructure modernisation which is expected to go live in 2020;</p> <p>The new US system will include an interoperable framework to enable all payments solutions to communicate with one another;</p> <p>Whilst not necessarily considered rationalisation, in the land of the free market, this is an important step in enhancing interoperability across multiple payment systems.</p>
<p><b>The Netherlands</b></p>	<p>The Dutch have been the first to team up as a banking community and declare 'instant as the new norm';</p> <p>When the Dutch scheme goes live in 2019, it will turn off ACH processing and decommission all legacy credit platforms.</p>

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## 11.0 Existing Challenges

Whilst RTP adoption has increased globally, there are still challenges that exist in ensuring smooth and safe operation of these systems.

### 11.1 Security and real time system attacks

Instant payments speed up transactions for end-users and facilitate the circulation of money, but also put pressure on the systems banks have in place to check suspicious transactions, look at the records of the payer and payee accounts and then assess the risk associated (fraud or system misuse) before authorizing the payment. This is a vulnerability that cybercriminals are aware of.

2018 saw the first real cyber-attack against a real time payments infrastructure. Mexico's central bank experienced a cyber-attack that removed around 300 million pesos (\$15.33 million) in fraudulent transfers from five companies<sup>4</sup>. The criminals had tapped into banks' connections to SPEI, the instant payment system to send false orders. There were several cash withdrawals from dozens of banks around the country shortly after the fraudulent transfers.

It is thought that the criminals could have accessed internal servers from the public internet or launched phishing attacks to compromise employees to gain a foothold. Many networks didn't have strong access controls, so hackers could take advantage of compromised employee credentials. The networks also weren't well segmented, meaning intruders could use that initial access to penetrate deep into banks' connections to SPEI and, eventually, SPEI's transaction servers, or even its underlying code base. Transaction data within internal bank networks wasn't always adequately protected, meaning attackers who had burrowed in could potentially track and manipulate data. And while communication channels between individual users and their banks were encrypted, SPEI itself may have had bugs and lacked adequate validation checks, making it possible to slip fraudulent transactions through.

The very nature of the system itself and that funds are sent and received in real time, allow for RTP systems to be seen as a riper target than traditional ACH systems. Cybersecurity therefore should be high on the agenda of any RTP infrastructure. Therefore, it is essential to have the necessary processes, personnel and technology to deal with threats and attacks.

### 11.2 Increased demands on customer authentication

Customer experience is key in payments: friction and slowness can reduce acceptance of the payment instrument at both the customer and merchant sides, leading to higher cancellation rates in the electronic e-commerce checkout process and longer queues in the store. As new players enter the payments space, secure customer authentication is vital to this process.

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<sup>4</sup> Wired, 'How hackers pulled off a \$20 million bank heist'

European PSD2 APIs require banks to perform strong customer authentication (SCA) on every transaction. This means that the customer's bank requires the customer to authenticate a transaction with at least two of three elements (known as two-factor authentication 2FA). The three SCA elements that can be used are:

- Knowledge, such as a username and password in online banking
- Possession, such as a smartphone or token device to receive an authentication code;
- Inherence, such as biometric data.

The PSD2 Regulatory Technical Standards allows exemptions from performing SCA in certain conditions, e.g. when the payment amount is below EUR30 for e-commerce (EUR100 accumulated, across a maximum of five consecutive transactions); or EUR50 for contactless instruments at PoS (EUR150 accumulated, across a maximum of five consecutive transactions). But even these exemptions lead to cumbersome SCA. For PSD2 and instant payments, SCA needs to be eliminated: the RTS allows the customer to 'whitelist' trusted beneficiaries and exempt them permanently from SCA. A merchant could incentivize a customer to add the merchant's own bank account to their whitelist and avoid SCA.

The inherence options also enables the customer to authenticate transactions via biometric data rather than cumbersome reception and submission of authentications codes. However, the biometrics-based methods used today on devices such as smartphones are proprietary solutions that perform fingerprint or face data matching on the device, beyond the banks' control. As innovation in this area continues, there will be a huge push towards creating RTS-compliant biometrics authentication methods.

For the convergence of open banking and instant payments to be successful, the authentication and consent model will demand increasing attention. It will be vital to ensure customers do not perceive further barriers to usage. By utilising public key cryptography techniques in combination with "one touch" biometrics and/or security keys, the proliferation of smart devices is likely to provide stronger authentication without burdening users. We will also likely see increased discussion on Digital Identity, where customers authenticate themselves digitally with service providers, thus removing a key pain point in the onboarding journey.

Tokenisation is fast becoming an area being explored by financial institutions. By replacing unique sensitive information or data with a token, the risk associated with account-based fraud can be significantly reduced, fostering safe and secure RTP initiatives across the world.

Elsewhere in the world, the banking community is developing pan-industry identification and verification solutions. For example in Canada, seven of the largest banks have launched a new blockchain-based digital identity network Verified.Me. In essence, the Verified.Me smartphone app will connect with financial institutions and remove many of the steps that are currently required to apply for financial services and government documents. Other large organisations are expected to join the network, allowing consumers to connect corporates to their Verified.Me profile to enable quick and secure sharing of information.

### **11.3 Interoperability of cross border payments**

The need for a cross-border instant payments ecosystem has been recognized by many countries. Regional schemes or global initiatives such as Ripple or SWIFT gpi have been developed to respond to this demand.

However, in an era where open services, choice and flexibility are paramount, the industry needs to avoid the pitfalls of the past and ensure interoperability of these platforms.

At the present time, it is likely that organisations will choose differing solutions for their cross-border needs. A single platform accessible by all FIs or infrastructure providers, allowing them to send real-time international payments, in a similar architecture context to CLS may be desirable to some but is unlikely to materialise in the near future.

With this in mind, an interoperability framework based on ISO 20022, where FI's and PSP's can select a platform that suits their needs is necessary. Pockets of activity are taking place in this space. The W3C (World Wide Web Consortium) Interledger Payments Community Group has been discussing the Interledger Protocol (ILP) as a standard way to enable frictionless transactions across networks. The International Payments Framework Association (IPFA) has also drafted a rulebook for cross border instant payments. The ISO 20022 Registration Management Group's Real Time Payments Sub Group has developed best practice for the use of ISO 20022 for real time payments.

There may be a need for a neutral global organisation to be created in order to assist the industry in managing these differing programs, and develop a regulatory regime that makes international instant payments possible.

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## 12.0 Key success factors for real time payments markets

Successful RTP systems have been those where the barriers to usage by the customer are low. In the UK, customers rarely make the choice for their payment to be executed as a real time payment. Most banks will use Faster Payments for retail payments as default. Other countries implementing RTP are considering the same process, e.g. Czech Republic. This can drive volume and help reduce transaction cost for the bank itself. The most effective RTP systems have been those that have integrated meaningful value-added services or where the operating model allows for third parties to build these seamlessly. In Thailand, in the first year of the launch of PromptPay there were 97 million transactions, totalling 370 billion Baht in transfers, across 37 million savings accounts. 25 million of those accounts were opened with citizen ID numbers and the rest with mobile phone numbers. This by any degree can be deemed a success, in large part due to the exceptionally low fees associated with using the service. This, combined with flexible architecture and a clear roadmap of initiatives from the Central Bank, will no doubt drive usage and confidence in the system. In India, UPI noted 781.79 million transactions in April 2019. Like Thailand, flexible architecture alongside openly published APIs enable third party application providers to build innovative services for customers at rapid pace encouraging use.

Consumer trust in the system is also imperative to its success. Security will become a significant subject both at an infrastructure level and at an individual level. The state of New Jersey in the US has introduced a bill that would mean penalties for failing to return erroneous electronic payments on money transfer apps such as Venmo and Zelle. This would fall under the state's theft law and penalties for theft in New Jersey

range from a \$1,000 fine to a decade of jail time depending on the value of what was taken and other factors. This has the potential to encourage support in P2P instant payments in the US, if customers see safeguards in place.

The payments industry is undergoing a transformation – with the implementation of Open Banking and real time payments, both banks and central infrastructures need to be well positioned for the future. As digitalization transforms the way businesses interact with their customers and challenges traditional business models, retail banks need payment solutions that enable them to respond with innovative new products and services rapidly.

### **12.1 Standardisation**

As real time payments systems become the basis for value added services, the importance of standardisation cannot be underestimated. A key enabler of change is the use of standards and in particular ISO 20022. ISO 20022 has recently become the default data standard for real time payment systems around the world. Systems built within the last several years (e.g. in Denmark, US, and Poland) all use ISO 20022, and stakeholders in countries with real time payment systems that use other standards (such as ISO 8583 or proprietary formats) have stated publicly that a move to ISO 20022 would be beneficial.

ISO 20022 is attractive due to its capacity for extensive remittance data, the ability to reuse ISO 20022 messages across multiple business areas, and the fact that it is a modern and flexible.

ISO 20022 can be used both as an interbank data standard as well as providing the data standardisation necessary to support API development. Meaning that banks can rely on one data standard to support all their payments requirements and market infrastructures can use one standard across multiple different payment systems. ISO 20022 even goes beyond payments, to support all financial messaging requirements. International efforts to support ISO 20022 across financial services, including Open Banking are being implemented worldwide. A common approach to data standards will not only ensure a level of ubiquity across the payments ecosystem, but also ensure consistent usability from the fintech community.

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## **13.0 What is next for real time payments?**

We are really only in the first wave of RTP implementation. The global payments industry has proved successfully that it can move money in real time, safely and securely. The next wave will see greater monetization of this service by both banks and third parties. Data will need to be moved as quickly as the funds themselves, and organisations will need to be able to provide tailored services built on robust data analytics. We will continue to see increased demand for access to RTP systems globally as new players jostle to provide these services to their customers. Whilst the initial focus of RTP implementation has been

P2P payments, strategies to increase usage in the B2B and B2C space will begin to take priority as banks seek to drive volume.

Payments are still a network business and therefore we will continue to see RTP infrastructures supporting the industry in continuing to maximize their investment. RTP infrastructures globally have a continued role to play, not just in the continued operation of the system but also in design and/or deployment of innovative value-added services, standards development as well as promotion of access and usage. We are seeing this in many countries, from FAST in Singapore's implementation of QR codes to Request for Payment in the UK and the US.

The rise of Open Banking adds another dimension to the real time payments ecosystem. If Open Banking is to include payment initiation services, then it's success is linked to the success of real time payments. Therefore, the impetus to 'get it right' will be strengthened. Payment initiation in the context of Open Banking will only be successful if a real time payments infrastructure is trusted and used by customers. Continued work will need to be done globally on consumer education both in terms of Open Banking and real time payments.

Real time payments are likely to be the 'de facto' method of credit transfer in the future, and a flexible but robust infrastructure is at the heart of the future economy. However, implementing the system is not the end of the story. Sufficient planning to understand usage volumes, a unified approach to legacy infrastructure and a strategy for increased value-added services should all feature in the recipe of a successful real time payments system.

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