CGI

Request-to-Pay APIs

Arteries for the "Retail Payments
Strategy Agenda" in Europe

Table of Contents

"How does Request-to-Pay make further account-based payment models feasible?"

"What is Request-to-Pay and how will it influence the success of instant payments?"

"How can Request-to-Pay contribute to the European Retail Payments Strategy Agenda and a new European payment system?"

01 Executive Summary

Executive Summary

A New Frontier in the Payments Industry

Request-to-Pay (RTP), the latest innovation in the payment transaction evolution, will be launched on November 20th, 2020 and will be the start of a new rulebook journey in the upcoming years. Despite recent developments in the payments sector, corporations and individuals, who request payments from other parties, still do not have access to an integrated way to proactively initiate and reconcile payment transactions. Acknowledging this challenge, the Euro Retail Payments Board (ERPB) has identified RTP as a key development for future payment services. Under guidance of the European Payment Council (EPC), the ERPB opted for the creation of an own SEPA RTP scheme that is separate from other SEPA payment schemes. RTP allows the Payee (biller or creditor) to trigger payment requests in all kind of relationships. "The RTP is a functionality, which complements the SEPA payment schemes to support end-to-end payment in all ways between Payee and Payer improving the user experience in retail, invoicing, P2P transactions, and others.

In the context of the established SEPA and TARGET infrastructure in Europe, it can advance the evolution of retail payments. RTP will create further business processing oppor-

tunities, performed by sending additional data under ISO 20022 messaging standardization. As a result, this topic will become increasingly relevant to experts and managers in the European payment ecosystem. Besides providing essential information about RTP, the purpose of this document is to show how RTP can be used to implement new business models in Europe, for which an Application Program Interfaces (APIs) model is proposed.

RTP is a feature that supports all business and use cases between any kind of Payee and Payers in all day-to-day situations, covering all channels. Here, example use cases and process flows for B2C POS Retail, B2B Financial Supply Chain, B2B Collections, and B2C Retail Installments will help deepen the understanding of the RTP functionality and its business application. Additionally, timing and processing models, as well as approaches to communication logic and pain messages are included for your reference. Combined, this will demonstrate how RTP messages can be integrated into the business of market participants.

Finally, as a contribution to the European Retail Payments Strategy Agenda, a model for a European payment system based on RTP is provided.

> Request-to-Pay as an API can be a key mechanism to facilitate the implementation of Europe's retail payment strategy agenda.

02 Request-to-Pay Basics

Request-to-Pay Basics

What is Request-to-Pay (RTP)?

According to the European Payment Council (EPC) Multi Stakeholder Group, Request-to-Pay (RTP) can be defined as the set of operating rules and technical elements (including messages) that allow a Payee (or creditor) to claim an amount of money from a Payer (debtor) for a specific transaction.[1]

RTP can be initiated by the Payee and transmitted to the Payer using technologies such as messaging applications, proximity technologies, specialized APIs, etc. Nevertheless, it is imperative to clarify that RTP is a new way to request a payment initiation but represents no actual change to payment means or payments instruments.
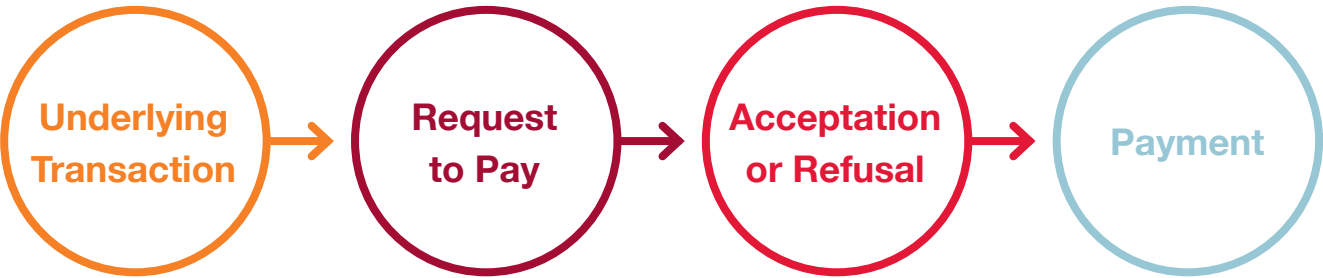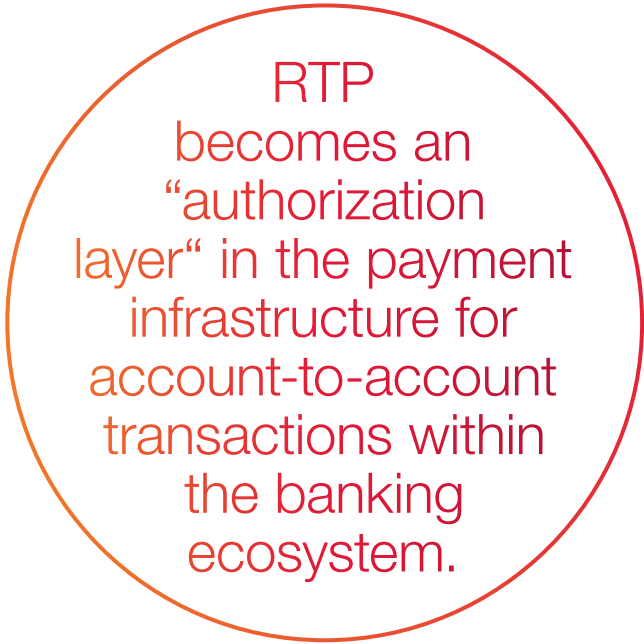
> RTP becomes an "authorization layer" in the payment infrastructure for account-to-account transactions within the banking ecosystem.

Underlying Transaction → **Request to Pay** → **Acceptation or Refusal** → **Payment**

Figure 1: RTP Process Components and Context

1: Specifications for a standardisation framework, RTP MSG 005-19/ Version 1.0/ Date issued: 4 November 2019

Benefits of RTP

RTP facilitates the request of a payment in a digital way and allows Payees to express their payment preferences (e.g.: pay now/ pay later). It empowers individuals, corporates and/or merchants to initiate payment transactions, leading to a higher degree of dynamics and efficiency in the entire payment ecosystem, where all parties can benefit from features such as:

- Convenience to pay
- Additional value-added data (data elements, invoices, etc.)
- A platform that can be used outside of the bank ecosystem
- Fast with 24/7/365 availability
- Final, as it requests a SCT (no return right)
- ISO 20022 and API data set

Why Does the World Need RTP?

With the transition to ISO 20022 and the anticipated adoption of real-time account-to-account transactions within SEPA Credit Transfer Instant (SCT Inst.), Europe will accomplish a payment infrastructure beyond cards. Within the banking ecosystem payment use cases can be facilitated in:

- Business-to-Consumer (B2C)
- Business-to-Business (B2B)
- Person-to-Person (P2P)

Instructions contained in the RTP bring convenience to the Payer both in the authorization and initiation of the credit transfer. Independently from cards, RTP can be compared with an "authorization layer" leveraging account-to-account transactions in corporate or retail payment channels. It follows the "order principle" meaning the Payee, having in general a high interest in getting paid, sends an "order" to pay to the Payer, who demands a high level of convenience. From a business risk perspective, a requested SCT has advantages compared to SEPA Direct Debit. In B2B SEPA Direct Debit mandates are not common in big enterprises and in all cases, where risk mitigation is needed, RTP brings benefits. RTP as an instrument to trigger a payment does not require integration within all banks themselves. It is sufficient that banks will be "reachable" and have real-time payment implemented. Established Automated Clearing Houses (ACH) as intrabank networks should offer RTP API services on behalf of their (bank) clients, which will achieve the necessary speed-to-market in a digital open banking ecosystem. In conclusion, enterprises will utilize new payment services giving them automation in their payment flows, improving cash flows and optimizing their payment-mix. Payment service users will be offered new options to pay using bank accounts and their mobile devices, which can replace plastic cards in many circumstances.
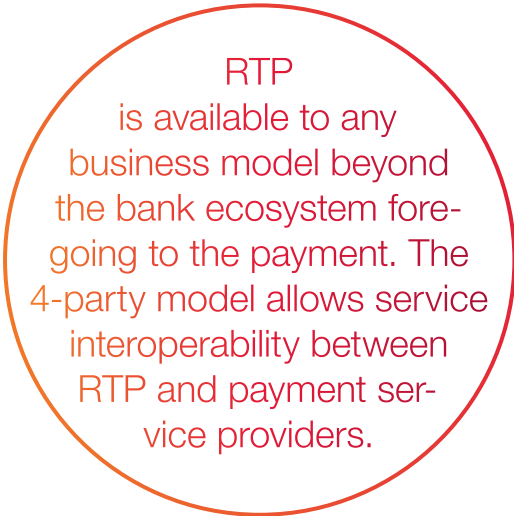
Who Can Offer RTP? – RTP Processing Models

Any party looking to receive a payment can in principle request it using the SEPA RTP set of rules (within the regulatory and operational limits of the relevant payment scheme). Banks, third party providers (TPPs), payment institutions, and non-regulated parties will have the opportunity to use RTP to improve processing convenience. In principle, anybody can adhere to the RTP scheme to fulfill the Scheme Rules and obligations. The payment initiation following an RTP can only be done by trusted actors within the regulated domain (e.g. banks, TPPs, payment institutions).

The processing models are categorized by involved parties, according to the number of actors as follows:
● Direct model (Payee – Payer)
● 3-party model (Payee, Payer and 1 PSP)
● 4-party model (Payee, Payer and 2 PSP)

Benefits

RTP will enable convenience in all kinds of (non-regulated) business models by simplifying business processes before initiating a credit transfer to the bank ecosystem. Banks may extend their revenue models within the existing regulation.

RTP is available to any business model beyond the bank ecosystem fore-going to the payment. The 4-party model allows service interoperability between RTP and payment service providers.

RTP Actors and Roles in a 4-Party Model

The illustration shows the participating actors and the RTP flows for a generic 4-party model eco-system, applied to basic use cases in physical or online retail commerce, P2P, or Electronic Invoicing Presentment and Payment (EIPP) transactions.

The identity of the Payer has to be available for the Payee, so that the Payee's provider is able to determine the route for reaching the Payer's provider, who will then present the authentication request to the Payer. For simplification, the payment flows are not presented. A 4-party model allows an interoperability between account holding service providers and responds also to the needs of an end-to-end integrated user experience and straight-through processing with multiple RTP service and payment networks.

Payee
Party initiating the RTP and to which the payment will be credited.

Payer
Party receiving the RTP from whom funds will be debited after providing approval.
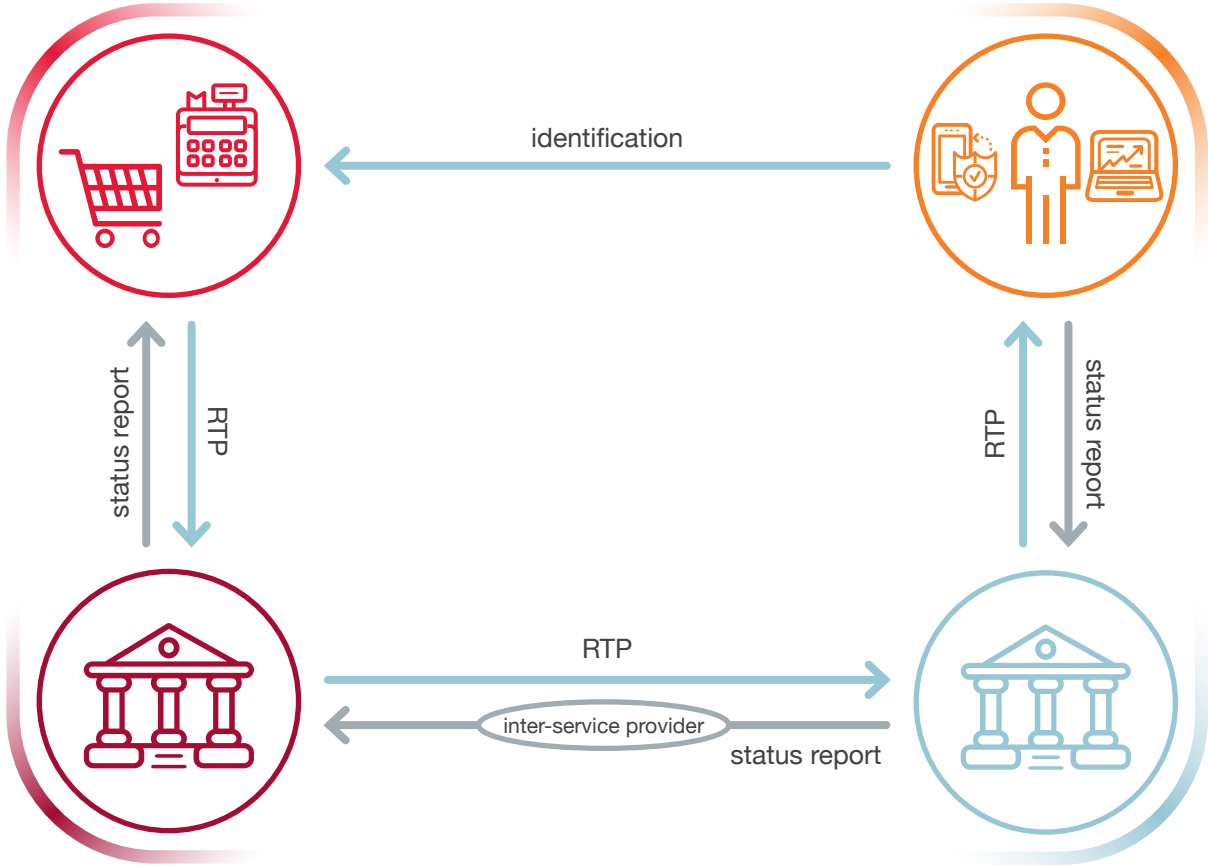
Payee's RTP Service Provider
Party processing the RTP request on behalf of the Payee. Also responsible for delivering the RTP to the Payer or Payer's RTP service provider.

Payer's RTP Service Provider
Party processing the RTP request on behalf of the Payer. Also responsible for communicating back to Payee or Payee's RTP service provider.

Figure 2: Actors in a 4-Party Model

Preliminary Outcome of the RTP MSG

- The definition of concepts, roles, entities and processing models
- The need to create an RTP scheme separate from the SEPA payment schemes. Starting from the basis of a 4-party model but with the potential to support other models and to allow RTP within the non-banking sphere
- The identification of ISO 20022 as the most suitable standardization framework for RTP.

Why a Separate Scheme for RTP?

After analyzing the advantages and disadvantages, the RTP MSG concluded that a separate scheme is the best option, as it will allow RTP to have:

- its own lifecycle, empowering cooperation with relevant stakeholders and interested parties
- a flexible adherence process, opening the adherence also to non-PSP RTP service providers
- more flexibility for the implementation of the technical standards and transport networks

ISO 20022

The RTP concept is based on the ISO 20022 message format. Therefore, RTP's breakthrough can be estimated in context with the ISO 20022 implementation due dates in Europe. Furthermore, it is expected that SCT Inst. will become mandatory within the next years.

Market Demand e.g. E-Invoicing

Nowadays, a significant portion of physical invoices follows common standards. Hence, when moving towards the digitization of the entire financial supply chain, it is safe to assume that no media breaks will be accepted after its implementation. Furthermore, a corresponding evolution of the accounting and payment processes is likely to be required to unlock the full potential of digitization. In Germany for example, starting in November 2020, suppliers must electronically submit their invoices to administrators according to the ZUGFeRD and the EN 16931 standard. The German governance body will drive the domestic e-invoicing implementation.

By November 2020, RTP will be available in SEPA and will grow together with the ISO 20022.

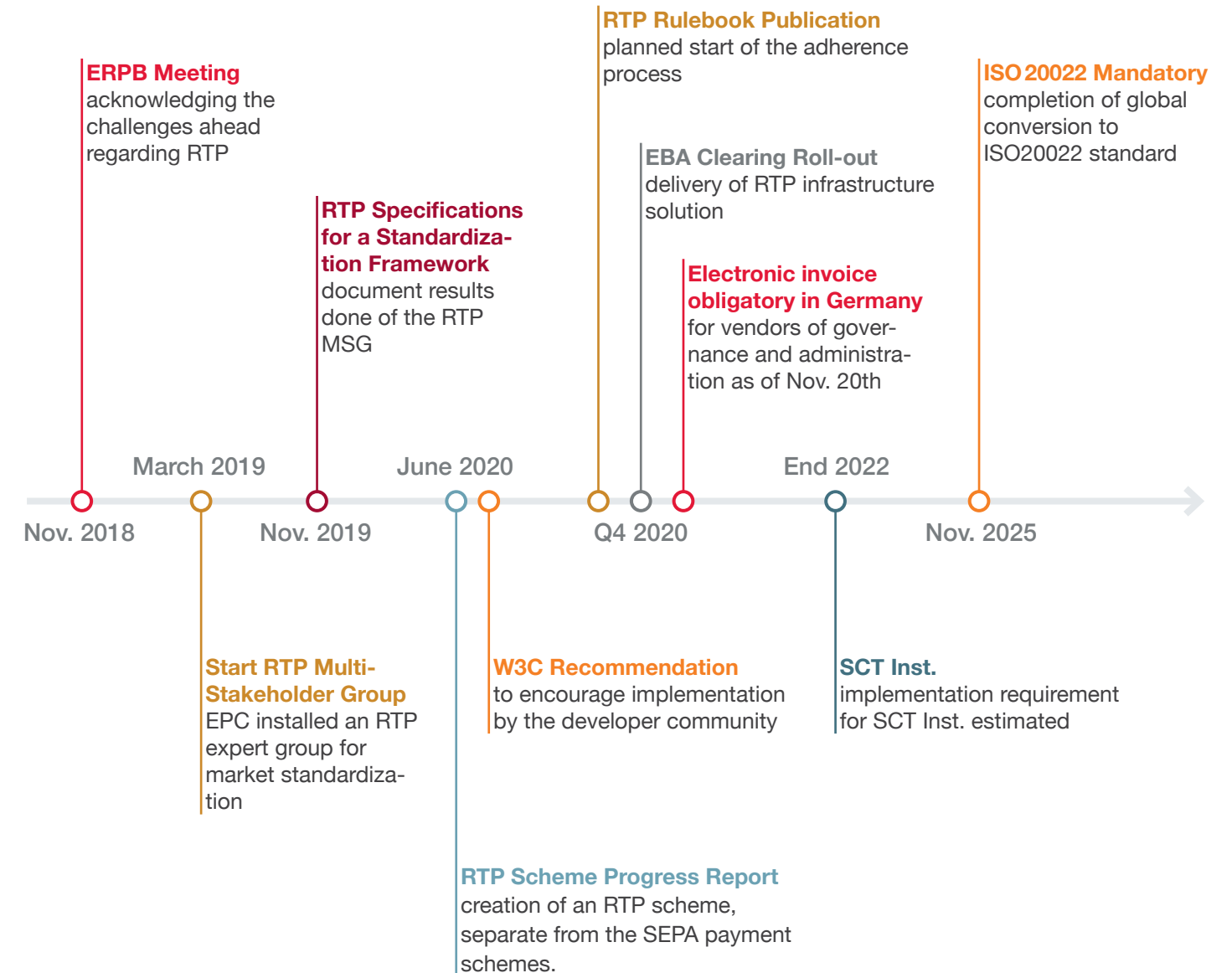## RTP Lifecycle Evolution

Figure 3: RTP Lifecycle Evolution

RTP Communication Layers

Creation and Presentment
It takes place at Points of Interaction (POI), e-commerce websites, e-invoicing for B2C, B2B, and during P2P transactions. Technologies such as proximity technologies e.g. NFC, QR codes, BLE or Messaging applications as well as websites.

Acceptation
Here the Payer authorizes a request to pay and initiates a payment:
- Accept the RTP[*] – for an immediate (now) future payment
- Decline the RTP – specify reason for refusal (optional)

Regulatory Technical Standards (RTS), e.g. for 2-Factor Authentication, need to be considered for payment initiation (End-User acceptation) – corporate and other models to comply with regulations.

Payment Initiation[*]
In this stage, the payment instrument is selected and is either immediately (now) or deferred (later) executed. In some instances customer authentication is required and a combination with RTP acceptance is useful for customer convenience purposes.

Specific Conditions Can Be Requested by Payee
There are several options, mostly related to the payment features, that can be requested and executed in this stage. These features can be necessary for the Payee to fulfill the order. Payment certainty (guarantee) has to be pointed out as one key parameter for many business models and other elements, which might have a huge relevance for certain industries or services.

Benefit
RTP brings a framework, a rulebook, and a standard to enable use cases with sufficient flexibility.

> Request a payment will be standard foregoing part of a payment transaction to create convenience.

[*]: Payment might be "embedded" in the acceptation. In that case, a user action of type "Accept", "Confirm" or "Pay" implies both acceptation of the RTP and initiation of the payment.
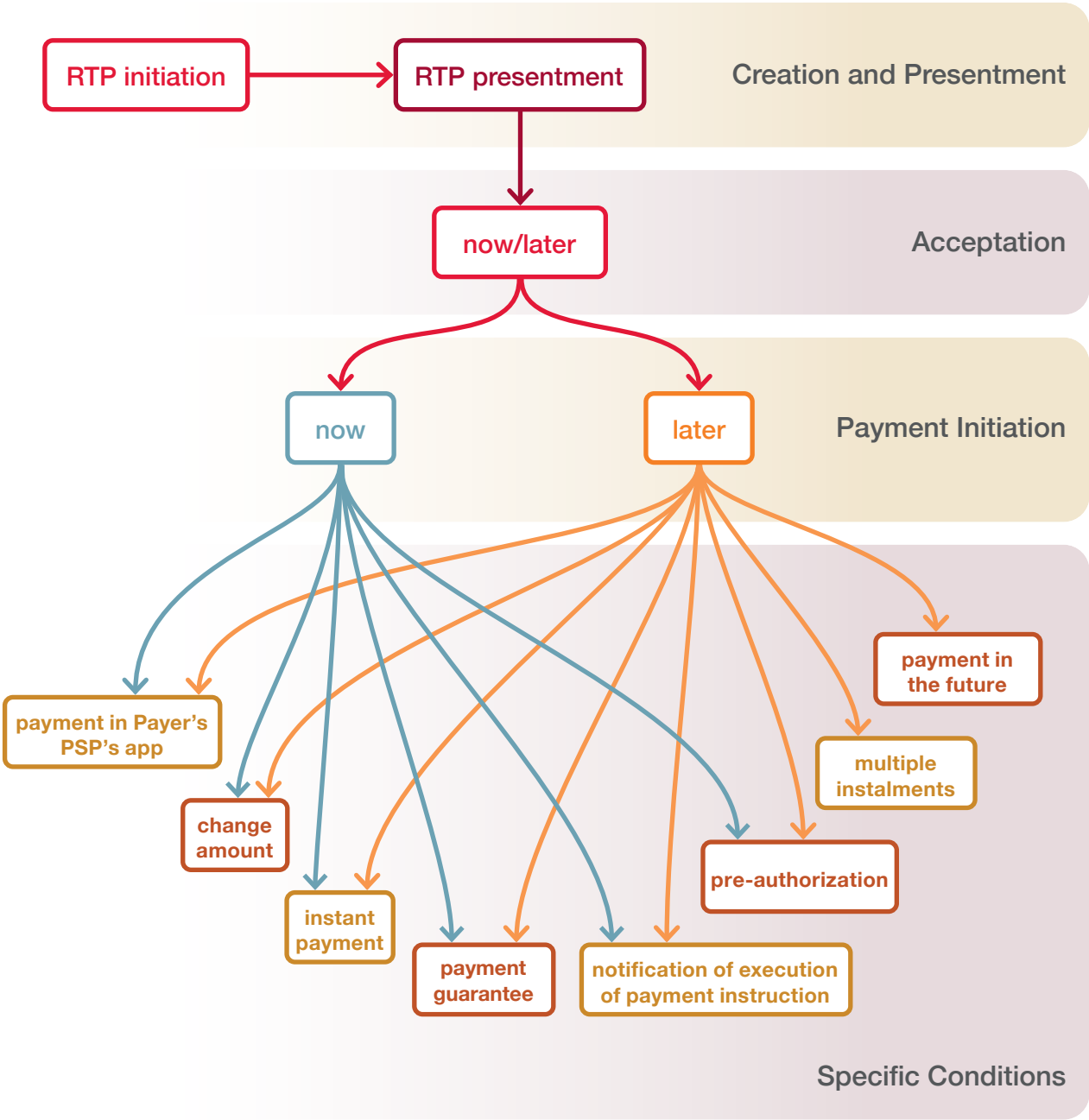

Figure 4: EPC Illustration: RTP Layers of Communication

RTP Payment Features
and Specific Conditions planned for future Releases in 2021[1]

Notification to the Payee of Execution of Payment Instruction

This function allows the Payee's PSP to be informed by the Payer's PSP through the inter-PSP network that the payment instruction has been executed. This notification helps the Payee to initiate subsequent steps of the purchase flow (e.g. preparation of delivery) before the payment is completed and the funds are received in the Payee's account.

Guarantee of Payment

It gives the Payee the certainty that the payment instruction associated with the acceptation of an RTP will be effective, so that the delivery of the goods and services can be safely triggered. The guarantee of payment can be implemented by reservation of funds or by other methods and may imply a pre-agreed liability. To establish a guarantee of payment, further financial arrangements might be needed between the actors, at present outside of the RTP framework.

Pre-Authorization of Payment

This is a guarantee of payment whereby a different amount from the RTP amount will be actually paid. In agreement with the Payer and for a limited period of time, a maximum amount can be indicated in the RTP and guaranteed (or "pre-authorized"), but on the basis of actual consumption of goods and services, a lower amount may be paid.

Instant Payment (SCT Inst. in SEPA)

The Payee can demand that the payment associated with the RTP is executed by an SCT Inst.

Payment in the Future

If this option is allowed by the Payee, it enables the Payer to choose a future payment date. The payment is automatically initiated at the future payment time by the Payer's PSP without further interaction with the Payer.

Payment of a Different Amount

If the option is allowed by the Payee, the Payer can pay a different amount than the amount indicated in the RTP.

RTP brings a framework of several options that can be customized according to the business case.

Benefits
- Key functionalities and conditions will be available for account-based transactions
- Payment acceptance is customizable in accordance with customers and/or business needs
- Account-based payment alternatives have the reach to more users

Payment in Multiple Installments

Combining the previous two functionalities, it provides the Payer the option to set up a sequence of payments for a single RTP, specifying the amount and number of installments. The payments in the sequence are automatically executed by the Payer's PSP without further interaction with the Payer.

Payment Initiation in Payer's PSP's Application

The Payer selects its PSP and does not communicate its identity to the Payee. The Payee sends an "anonymous" RTP to the Payer's PSP, which, in return, provides a secure URL for acceptation and payment in the e-banking interface.

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03 Market Needs & Use Cases

Use Case: Retail–POS–Merchant Scan
Purchase at POS Using RTP Instant Payment

Situation
A 16-year-old woman would like to buy a jacket in a retail store. Unfortunately, she has not enough cash and no credit card available. She has a bank account with sufficient funds. The merchant requires payment certainty before handing over the high fashion jacket.

Complication
The young lady and the merchant are ready to process the sale. Even with sufficient funds in her bank account the payment instrument is a challenge for both to make the sale and the merchant knows the risk to lose a revenue opportunity if she leaves the store.

Solution
The merchant POS offers its clients the possibility to request an instant payment from a bank account. The merchant scans a QR code from the young lady's mobile device generated by a new European payment app. The merchant RTP PSP uses the token to transmit the RTP to the lady's bank. After a few seconds, the young lady approves the RTP and initiates a credit transfer (SCT Inst.) using a face-recognition for strong customer authentication purpose in her (secure)banking application.

> Request an Instant Payment combined with NFC or QR codes will push account-to-account transactions beyond cards.
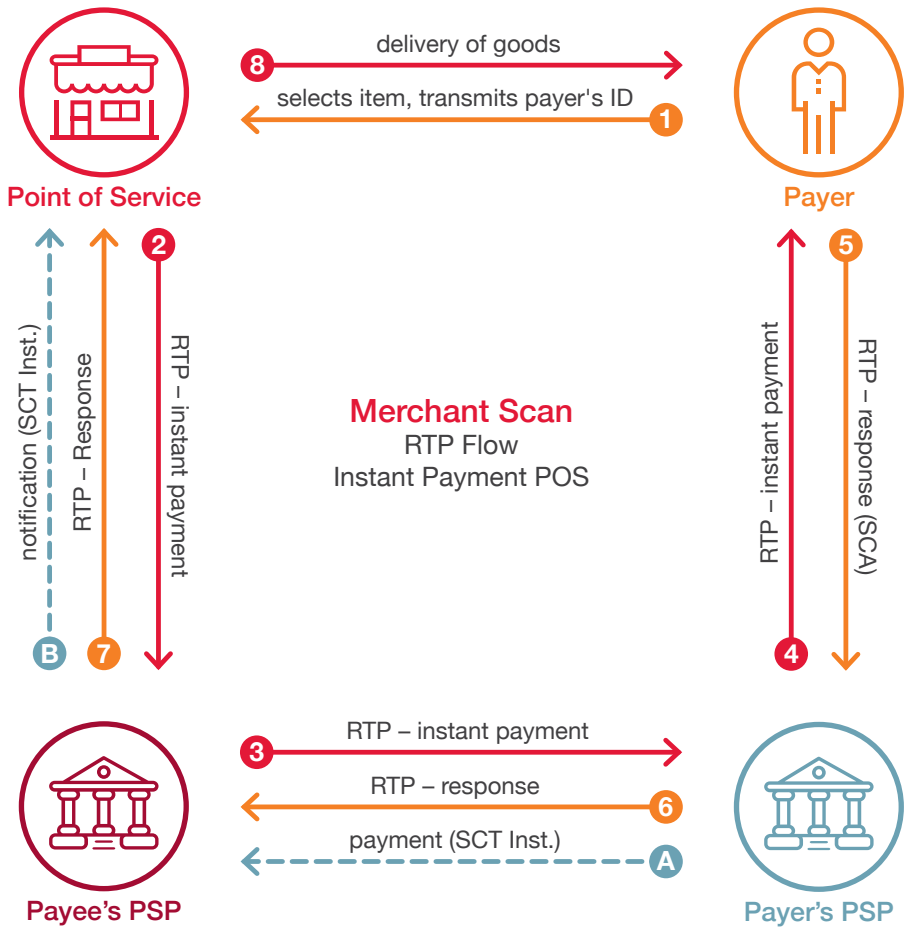
Figure 5: RTP Flow - Instant Payment POS

POS Merchant – Payee Benefits
- Optimizing (card) fees and immediate cash flow
- Alternative payment instrument
- Automated processes, reconciliation

Customer (End User) – Payer Benefits
- Bank-trusted payment alternative – reach to all account holders
- Mobile convenience: notification and approval via smartphone
- Real time product delivery

Use Case: Retail–POS–User Scan
Purchase at POS Using RTP QR Code Instant Payment

Situation
A small delicatessen merchant is selling a selection of fine prepared foods to a customer and has no payment device.

Complication
Without a payment device the merchant can only accept cash. Delicacies are quite expensive, and customers prefer to pay cashless. Someone will miss a wine to complete a tasty meal, but that is a different story.

Solution
The small merchant presents a QR code as an RTP on his deli desk (offline/printed) or digitally with his smartphone. The customer scans the QR code while a payment app opens in order to initiate the payment. In case of an offline QR code, the customer needs to enter the amount to be paid and authorize the payment with his smartphone. The small merchant receives a confirmation of the received payment amount on his smartphone.

> The QR customer scan transmits the payee (merchant) bank data in an RTP.
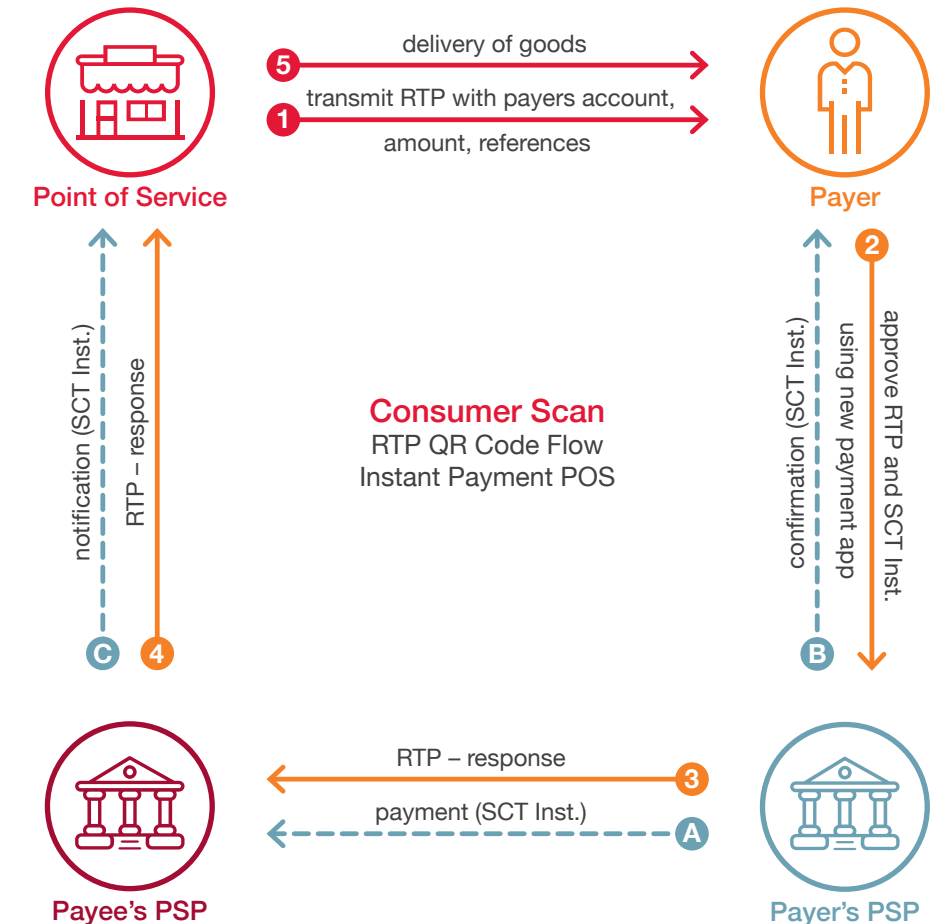
Figure 6: RTP QR Code Flow – Instant Payment POS

Benefits
- **Merchants:** no complicated POS implementation, immediate consumer reach, payment certainty, immediate account-to-account payments, easy check-out
- **Payment App:** easy implementation at consumer's and merchant's side thanks to readiness of smartphones to scan QR codes
- **Consumers:** bank trust payment alternative – accessible to account holders for mobile convenience

Use Case: Collections and Invoicing
Invoice Collection Using RTP Payment in the Future

Situation
A wholesaler ships goods daily to three of its customer's retail stores, which are franchisers. The quantity and product selection vary depending on its customer's needs, which the wholesaler obtains from an integrated ERP system that automatically and periodically notifies the wholesaler with the restocking details. The retailer wants to make sure that the franchiser has sold the items in its retail stores before paying the wholesaler centrally.

Complication
The wholesaler submits invoices to the retailer, but has no certainty on when they will be paid, because the retailer has to counter-check their franchiser stocking information manually. The wholesaler needs to improve his collection process.

Solution
Once the wholesaler gets the restocking information, he sends an RTP including the restocking notification data of the retailer. The retailer accounting can easily verify the information and accept the RTP, and, as a consequence, approve the scheduled payment to the terms of their buyer-seller agreement. The retail payer's PSP will automatically initiate the payment at the due date from the accepted RTP without further interaction.

> For B2B, electronic payment requests (RTP) have high processual fit to various use cases.
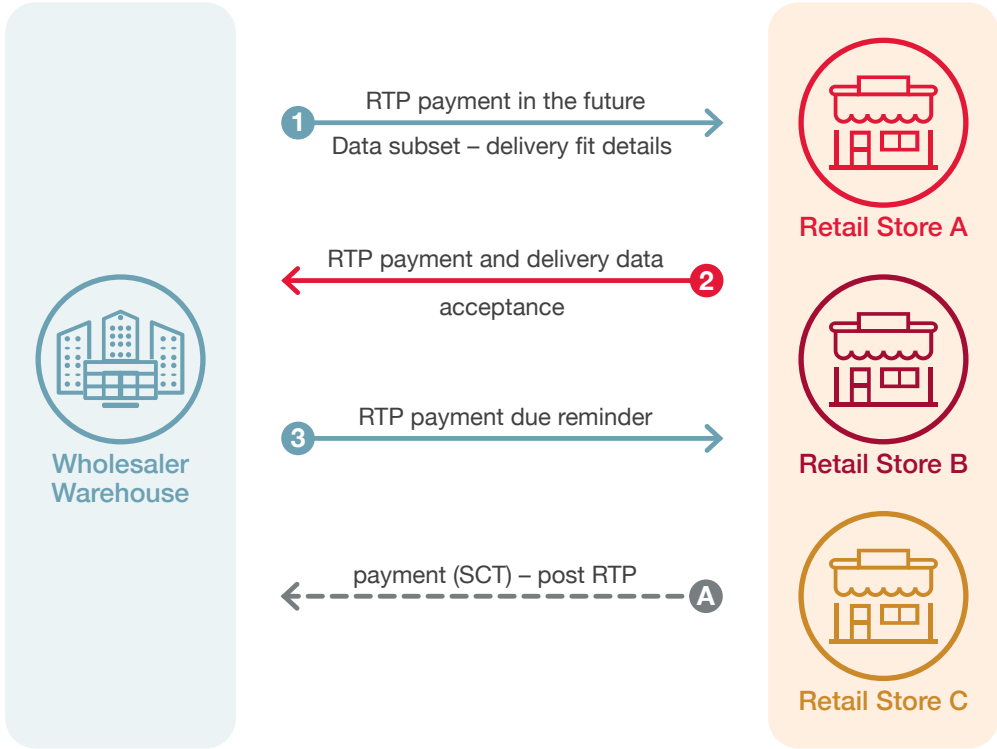
Figure 7: RTP Flow - Payment in the Future

Diagram elements:
- Wholesaler Warehouse
- Retail Store A, Retail Store B, Retail Store C
- 1 — RTP payment in the future / Data subset – delivery fit details
- 2 — RTP payment and delivery data acceptance
- 3 — RTP payment due reminder
- A — payment (SCT) – post RTP

Benefits

Wholesaler
- Visibility of payment status: paid and non-paid
- Improved invoice collection, better payment data service to its client

Retailer
- Payment status visibility and immediate verification data
- Flexibility: payment mapping according to supply process

Use Case: Financial Supply Chain
In-Time Delivery Payment Using RTP – Business to Business

Situation
A manufacturer purchases 100.000 units from a supplier, with 20 in-time partial deliveries of 5.000 units each. Nonetheless, the supplier currently has an insufficient cash flow to cover the working capital costs and cannot offer the manufacturer a vendor credit line with a 60-90 days payments cycle as usual.

Complication
The supplier has to improve its working capital. A common approach to this problem would be requesting a bank loan to fund the manufacturing process. However, this approach usually comes with high-interest rates and further expenses.

Solution
Instead of asking for a short-term bank loan, the supplier and the manufacturer agree on partial in-time payments paid with delivery. Through this agreement, the manufacturer receives a 3% discount paying immediately with delivery. The manufacturer transmits the RTP together with the delivery note. The supplier's logistic company submits the RTP together with the delivery and invoice note to the Payer and its PSP. After acceptance by the Payer the credit transfer will be executed and at each step financial and supply data are transparent. The supplier remains fully operational, improves its working capital, and avoids interest rates.

For B2B, electronic payment requests (Request-to-Pay) have high processual fit to e-billing.
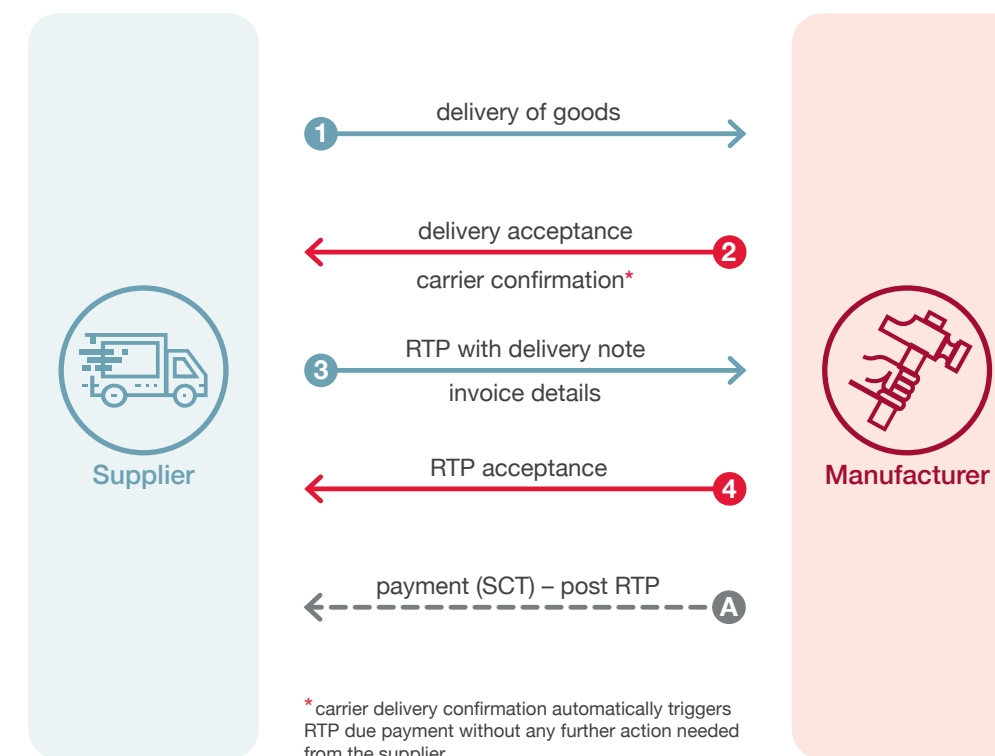
Figure 8: RTP Flow – In-Time Payment

*carrier delivery confirmation automatically triggers RTP due payment without any further action needed from the supplier

Benefits
Supplier
- Improved cash flow, working capital, lower financial risk (no vendor credit line)
- Automatic in-time payment cycle, which can be administrated by logistics company

Manufacturer
- Payment discount of 3% and exact fit of supply and financial chain transactions
- Transparent data subset included in payment flow to avoid long manual verifications
- ERP integration of payment and inventory management possible

Use Case: E-Commerce
Purchase Using RTP Instant Payment – Business to Consumer

Situation
A teenage customer wants to go to a concert with his friends. His preferred ticket online shop requires immediate payment certainty to provide digital tickets. For fraud prevention the ticketing merchant verifies cardholder's or Payer's addresses in a CGI HotScan Risk System. If the address verification service of an issuer bank is suspicious the online shop declines a transaction.

Complication
The teenager does not have a credit card.

Solution
Once the customer has selected the ticket(s) he enters his account details in the check-out page. The merchant's CGI HotScan Risk System denies a SEPA direct debit transaction due to the scoring data.

Instead of declining, the ticket shop PSP sends an RTP instant payment to the Payer's PSP and requests an instant SEPA credit transfer (SCT Inst.). The customer receives a notification that the banking security app requires an RTP approval to initiate an instant payment transaction to the ticket shop. Once the customer confirms, the RTP acceptation and the payment will be executed.

Furthermore, if the teenager tries to use his parents' account details the approval will be requested from his parents. It is recommended to make the RTP expiration time not too short, so that the teenager has enough time asking his parents to approve the RTP.

> RTP brings commercial and processual convenience as benefits to high-risk e-commerce areas.
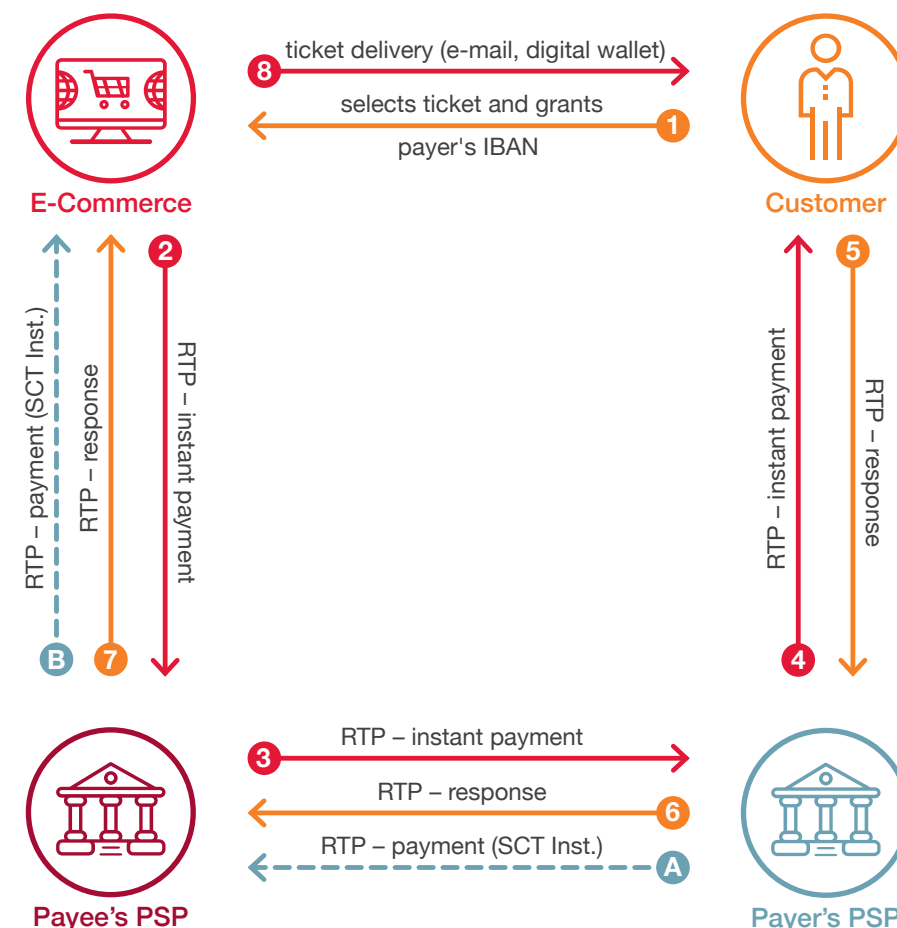
Figure 9: RTP Flow – Instant Payment

Benefits

Online Merchant
- Higher conversion with payment certainty beyond SEPA Direct Debit
- Avoiding fees for address verification from card intermediaries

Buyer–Customer
- Applicable payment alternative within existing bank account
- Immediate instrument and convenience within banking application

Use Case: Retail – Installments
Using RTP Multiple Installments at a POS – Business to Consumer

Situation
Buying an expensive TV at a POS using RTP Multiple Installments. It is mid-December and a potential client walks into a store looking for a family Christmas present. All the features of a new 4K TV would make a perfect gift, especially since the item has a 20% Christmas season discount.

Complication
The customer realizes that her current funds are insufficient to pay for the TV, even after applying the 20% discount.

Solution
Instead of asking for a credit line or to leave without the TV, the customer takes advantage of the multiple installments option offered by the merchant. With this solution the customer pays an amount that is convenient for her. The remaining balance will be divided to several monthly payments. As a result, the customer takes the TV home.

Exemplary calculation:
- TV regular price is EUR 1,000 – temporary EUR 800 (20% discount)
- Customer's account available balance is EUR 500
- Multiple installments are: two monthly payments of EUR 150 each, EUR 300 total

According to the above variables, the Payer's PSP will send one RTP with the equivalent payment instructions. If necessary, the Payer's PSP can send an RTP request for each variable, too.

Electronic payment requests have high procedural fit to e-billing and installments.
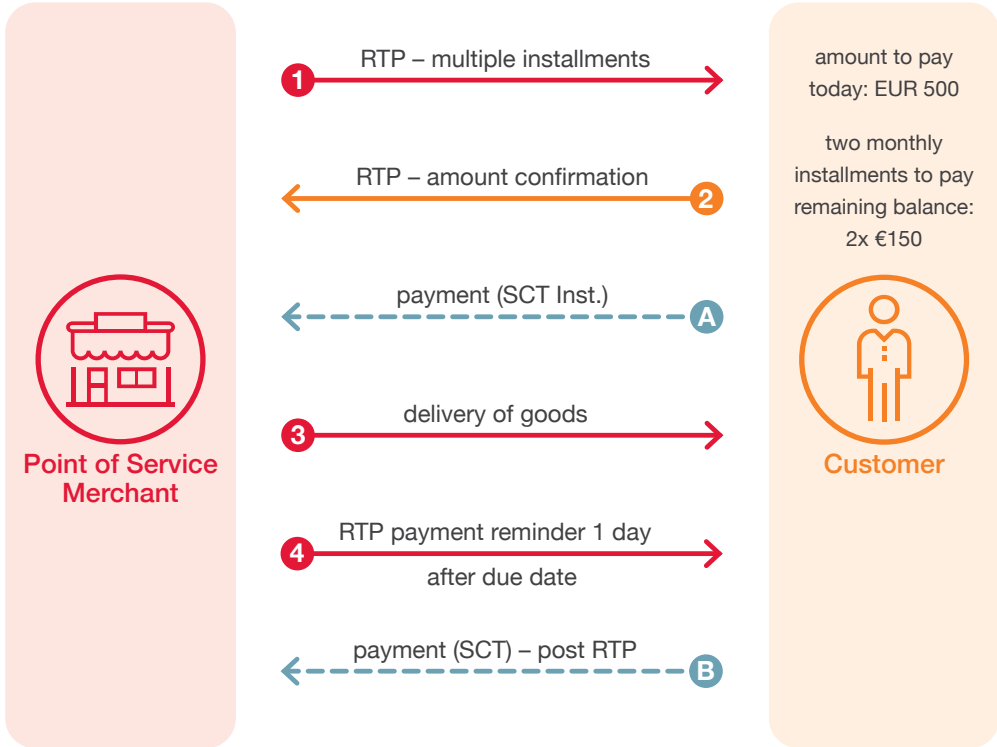
Figure 10: RTP Flow – Multiple Installments

Benefits
Customer
- Taking advantage of the 20% seasonal discount
- Using his current balance and partially pay the remaining amount

Buyer–Customer
- Turning potential customers into real-time buyers
- Increasing total revenue

04 RTP APIs Enabling the Payments Landscape

How Does RTP Work as an API?

Integration

The RTP integration can be simplified and automated through the use of Application Programming Interfaces (APIs) provided by Automated Clearing Houses (ACHs). As a result, payees/merchants Payment Service Providers (PSPs) can effectively integrate this API Service to the required channels.

Banks can easily enrich their API Market by passing an ACH RTP API to the digital ecosystem. Retail or corporate tech providers such as PSP or ERP systems will integrate RTP initiation options. RTP allows non-regulated third parties to send and receive requests for payment to or from a regulated trusted PSP (e.g. bank, ACH).

It provides a range of options for the data provided in the request, and a range of options for a payer to respond to a request.

To achieve digital speed-to-market ACHs and interbank providers should offer an RTP API on behalf of the bank.

The salient features of an RTP API are:
- Authorized participants can operate with an ACH API
- RTP can flow without regulation until the moment of payment instruction when integrity has to be insured by the trusted parties
- TPP, PSP Participants are vetted, and their identity is established
- Secure and structured messages enabling automation

Benefits of RTP

An RTP API provided by the leading ACHs with interoperability to each other would allow a fast distribution to the digital ecosystem on behalf of the banks or via the API Developer Portals.
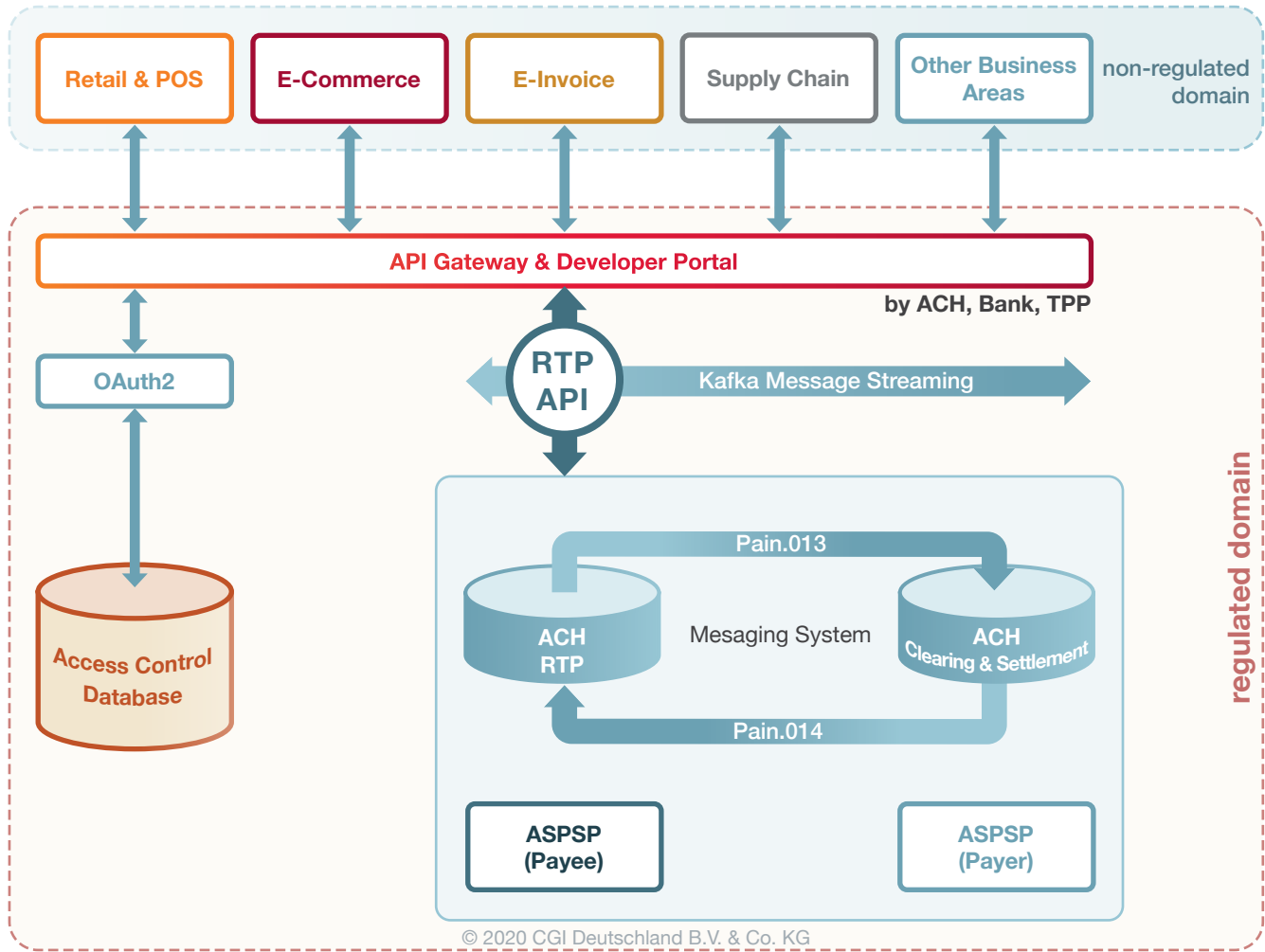
Figure 11: RTP API Gateway Model

Convergence Between ISO 20022 and RTP

RTP Data Options and Flows

To efficiently communicate at a pan-European level, ISO 20022 RTP is recommended for financial messages. The following two messages under the payments domain are considered:

- Pain.013, Creditor Payment Activation request to be initiated by the Payee
- Pain.014, Creditor Payment Activation Request Status Report used to inform a party whether the RTP has been accepted or rejected

The graph below illustrates the communication among a 4-party model:

According to the RTP MSG this approach:

- Fulfills the identified requirements for a broad RTP function
- Enables the harmonization with the payment's standards for SEPA schemes
- Allows providers to leverage their developments of ISO 20022 implementations in the payments and other business areas
- Exception processing, i.e. Request for Cancellation and Status updates, will be possible

> PAIN.013 message type has already all data elements to support business models.

*For Payee/Payer to/from their providers, the RTP can be represented in other formats than as ISO 20022 messages

Figure 12: Message Flow 4-Party Model

Group Header	
Initiating Party	● **Name:** Optional, max. 1 entry ● **Postal address:** Optional, max 1 entry. ● **Identification:** Organization vs. Private (BIC, ID, Scheme name, date and place of birth, other) ● **Country of residence:** ISO 3166 code ● **Contact details:** Optional: name, phone number(s), email address, other
Payment Information	
Payment Type Information	● **Priority:** Processing urgency instructed to receiving party ● **Service level:** Agreement or rules for processing
Requested Execution Date	Payment clearance date requested by the initiator
Expiry Date	Approval or rejection deadline before the request becomes voided
Payment Condition	● **Amount Modification Allowed:** Authorization to pay a different amount than requested ● **Guaranteed Payment Requested:** Request available only if payment guarantee agreement exists
Debtor	● **Postal address:** For address verification purposes ● **Identification:** Organization vs. Private (BIC, ID, Scheme name, date and place of birth, other)
Debtor Account	● **Identification:** IBAN, BBAN, UPIC or proprietary ● **Name:** Works as an additional account identification method
Charge Bearer	**In general:** Party bearing the transaction costs. BEN or OUR share agreements use, possibly to use for fee agreements within pan-European actors
Credit Transfer Transaction	● **Amount:** Before charges deduction -currency as ordered by the initiating party- ● **Creditor:** Identification and contact details of party to which money is due ● **Creditor Account:** Creditor account to which payment transaction will be credited ● **Remittance Information:** Information vital to matching the transfer settlement (structure/unstructured) ● **Enclosed File:** Document summarizing the transaction details (e-invoice) send as; PDF, txt, XML, other
Supplementary Data	
Additional information that cannot be captured in the structured elements and/or any other specific block	

The table above contains sample data that could be communicated along the RTP ecosystem. Additional information – including attachments – can be added as per request to fulfill the customer-specific business needs.

Moreover, since the Pain.014 is a status report of Pain.013, the information contained in both data files would be similar but with a few exceptions, specific to the purpose of each message.

W3C Recent Developments on RTP APIs

What Does W3C Stand for?

The World Wide Web Consortium (W3C) is an international community, where members and the public work together to provide standards that make the web more accessible, leading it to its full potential. Such standards are internationally recognized by governments and business.

What is W3C's Viewpoint on RTP?

W3C has become a reference point when it comes to the future of web regulations, developments and implementations. Therefore, its latest candidate recommendation for Payment Request API released on December 12th, 2019, serves as guidance, which allows:

- Merchants: to utilize one or more payment methods with minimal integration
- User-Agents: to facilitate the payment flow between merchants and users
- The recommendation also suggests developers to be aware that a Payment Request must keep track of essential pieces of information in order to use API.

Even though the candidate recommendation is considered a work in progress, the W3C believes it contains enough information to encourage implementation by the developer community. A finalized proposed recommendation is projected to be released after June 1st, 2020.

Among the information essentials, the MethodData specifies the supported payment networks, which is one of key elements that significantly contributes to the revolution of the payments landscape. So far, credit cards have dominated the market as the main supported network. However, thanks to the alignment between RTP and ISO 20022, other networks such as SEPA and SEPA Inst. could be potentially added.

RTP message type is nothing new to the digital ecosystem.

W3C Payment Request – Information Essentials	
PaymentMethodData	Payment methods sequence support by the site (e.g., card-based payments like Visa or MasterCard credit/debit cards)
PaymentDetailsInit	The transaction details dictionary such as; total cost, shipping options, a list of goods or services being purchased, among other detail options. It also has the option to include "modifiers" such as; network processing fees
PaymentOptions	A list of options needed to deliver the good/service. (physical address details for physical goods versus E-Mail for digital goods).

```
EXAMPLE 1: The `methodData` argument
const methodData = [
  {
    supportedMethods: "basic-card",
    data: {
      supportedNetworks: ["visa", "mastercard"],
    },
  },
  {
    supportedMethods: "https://example.com/bobpay",
    data: {
      merchantIdentifier: "XXXX",
      bobPaySpecificField: true,
    },
  },
];
```

Data sequence elements where alternative payment networks can be potentially added

Figure 13: W3C Illustration: Multiple Ways of Paying "MethodData"

QR Codes for RTP APIs

Quick Response Code

A two-dimensional code consisting of black modules arranged in a square pattern on a white background. A Quick Response (QR) code is an example of a 2D code as specified in ISO/IEC 18004. In the context of mobile card proximity payments, the QR code is used as a means of payment initiation, in one of two modes:

- Merchant-presented QR code – where the code contains data to identify the merchant and transaction
- Consumer-presented QR code – where the code contains data to identify the customer

In the case of a merchant-presented QR code, consumers need to have a mobile application on their mobile device that has the capability of scanning the QR code of the merchant and initiating a mobile card payment transaction. Merchant-presented QR codes have been specified by EMVCo.

In the case of a consumer-presented QR code, consumers can make purchases using data associated with themselves or their card and previously provisioned to their mobile device. This data may range from cardholder identification data, over credentials to chip card data, which are used to calculate a QR code (static or dynamic). Consumers typically have to select the QR option for card payment within their mobile card application, which will result in the display of the QR code on the mobile device. The QR code is scanned by the merchant at the time of payment to complete the purchase. Consumer-presented QR codes have been specified by EMVCo.[3]

NFC and QR codes will be key elements for RTP data interpretation.

3: White paper: Non-NFC based MobileSEPA Card Proximity Payments, EPC109-19 / Version 1.0 / Date of publication: 7 June 2019, page 18

Mapping Between Elements of QR Code Specifications with ISO 20022 RTP

ISO 20022 RTP (pain.013)	MSCT QR Code
PaymentTypeInformation ‣ LocalInstrument	Identification of MSCT payment context
Initiating Party ‣ identification	MSCT service provider
Creditor ‣ OrganisationIdentification ‣ Identification	Proxy/token Beneficiary
Creditor ‣ OrganisationIdentification ‣ Issuer	Proxy/token provider
Creditor ‣ Name	Name of Beneficiary
Creditor Agent ‣ BIC	BIC Beneficiary ASPSP
CreditorAccount ‣ Identification ‣ IBAN	IBAN Beneficiary
Purpose	Purpose of credit transfer
RemittanceInformation ‣ Structured	Remittance information structured
RemittanceInformation ‣ Unstructured	Remittance information unstructured
Amount ‣ ActiveCurrency	Currency
Amount ‣ CurrencyAmount	Transaction amount
Supplementary Data	Beneficiary to Originator information

POS RTP via QR Code User Scans

Use Case Process Flow

Participants:
- payer's ASPSP
- payer's MSCT service provider
- payer (consumer)
- mobile device (consumer)
- payment terminal
- payee's RTP service provider
- payee's MSCT service provider
- payee's ASPSP

1. Create and send RTP
2. Check RTP
3. Complete RTP
4. Generate RTP in QR-code format
5. Display RTP in QR-code and transaction amount
6. Open mobile app
7. Scan QR-code
8. SCT Inst. instruction with End-to-End identifier linked with RTP
8. Initiate and send SCT Inst. instruction with End-to-End identifier linked with RTPQR-code format
9. Check Integrity
10. Check availability of funds
11. Authentication request
12. Request authentication to approve both a) RTP and b) SCT Inst.
13. Present authentication
14. Verifiy and generate authentication code
15. Authentication response
15. Authentication response (RTP acceptance and payment authorization)
16. Check Authentication code
17. Prepare SCT Inst.
18. Create status report of RTP
18. Process and send status report of RTP
19. Submit SCT Inst. payment
20. Inform payer about RTP and SCT Inst. initiation
20. Inform payer about RTP and SCT Inst. initiation
21. Credit beneficiary's account
21. Confirmation message for SCT Inst. payment
22. Notification that account has been debited
22. Notification that account has been debited
22. Notification that account has been credited
22. Notification that account has been credited

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POS RTP via NFC
Use Case Process Flow

payer's ASPSP

payer's MSCT service provider

payer (consumer)

mobile device MSCT app

payment terminal

payee's RTP service provider

payee's ASPSP

4. Activate mobile and process delegated SCA. Hold mobile over POS terminal to accept RTP

1. Create and send RTP

2. Check RTP

3. Present RTP (with expiry time criteria)

5 Transmit RTP via NFC antenna

6. Route accepted RTP & delegated SCA

7. Route accepted RTP & delegated SCA (to initiate SCT Inst.)

8. Check Authentica-tion

9. Check integrity

10. Check availability of funds

11. Prepare SCT Inst.

12. Execute SCT Instant Payment

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13. Confirmation of RTP (pain.014) notification account will be debited

13. Confirmation of RTP (pain.014) notification account will be debited

13. Confirmation of RTP (pain.014) notification account will be debited

14. Credit beneficiary's account

15. Confirmation message for SCT Inst. payment

16. Notification that account has been credited

16. Notification that account has been credited

05 RTP Value for the "Retail Payments Strategy Agenda" in Europe

ECB New Payments Strategy for Europe

Excerpt from MIP OnLine[4]

In his introductory speech, ECB Executive Board member Benoît Cœuré, acknowledged that the industry had failed to deliver "payment services that work across borders and that are also faster, cheaper and easier to use". He therefore called for "European stakeholders to step up their collaboration and act together to provide payment solutions that both reflect the demands of consumers and strengthen the Single Market".

With this in mind, Benoît Cœuré announced that the ECB's Governing Council had recently relaunched its retail payments strategy. The aim is to foster pan-European market initiatives for retail payments at the so-called point of interaction, i.e. the location of purchase. An industry-led solution could be based on the SEPA instant credit transfer (SCT Inst.) scheme and existing powerful infrastructures such as TARGET Instant Payment Settlement (TIPS).

Pan-European payment initiatives should fulfill the following five key objectives:
- Pan-European reach and customer experience
- Convenience and cost-efficiency
- Safety and security
- European identity and governance
- Global acceptance in the long-term

Putting Customer Experience at the Center of Payment Services

The increasing use of smartphones and mobile apps has changed the way consumers interact in a digital world. They expect payments to advance hand in hand with technology and move seamlessly across borders, platforms and devices. The growing market for payment services allows them to choose from a wider variety of traditional and alternative payment service providers. Thanks to digitalization, consumers, who are dissatisfied with the payment services offered by their current provider, can now more cheaply, easily and quickly switch to another.

With consumer experience at the heart of payment services, the conference speakers suggested that finding the right balance between convenience, security and cost is the right way to develop a successful retail payment solution. Moreover, consumers should not be pushed towards certain means of payment or certain technologies, but rather be appropriately informed and allowed to follow their personal preferences.

4: MIP OnLine - 2020, Crossing the chasm to the retail payments of tomorrow, January 2020
https://www.ecb.europa.eu/paym/intro/mip-online/2020

> SCT Inst. based payment solution will require a proxy comparable to cards to accomplish commercial revenue models.

European Payment API Proxy
CGI Solution Architecture Approach

Payee / Merchant

Store

POS | E-Commerce | App

Treasury

Form Factors

ERP (SAP) | POS NFC

POS (QR) Code

Invoice | API

User Interface by Bank, Acquirer, PSP Look & Feel (white label)

User Interface Payee to Merchants, Corporates

Treasury Service Need

Adherence Process

Request (RTP)

CGI

CGI European Payment Premium API Model as Proxy

| API Developer Sandbox for Digital Service Delivery | End-User API Service for TPPs |
| API Acceptance Host (all channels) Merchant Identifier (MIDs) | One Token ID (primary user key) for digital & physical applications |

Merchant Whitelisting – Delegate SCA Functionality

Fraud Prevention, AML Screening and Risk-Analytics System

Interoperability Integration and Routing Layer

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User Interface by Bank or Payment Brand

User Interface Payer to end users and P2P

Convenience Need

Authenticate Identity

Authorize

Payer / User

Form Factors

Cards | Mobile

Wearables | E-Wallet

Online Bank

Domestic Card Systems (SCC) | RTP initiated money transfer (SCT) | RTP initiated Instant Payments (SCT Inst.) | SEPA Direct Debit (SDD) | Loyalty Services Value Added Services

girocard | MC/VI | STEP2 | TARGET2 | RT1 | TIPS | STEP2 | Payback | Others

Inter - Provider Space

A pan-European payment solution proxy requires banking value adding building blocks to realize convenience for Payers and Payees.

06 CGI Solutions at a Glance

CGI Solutions Enabling RTP Business
Ordo, CGI Open Finance, CGI HotScan360

Ordo RTP Services in UK

Ordo moved to live operation in March 2020 as one of the UK's first comprehensive 24/7 Request-for-Payment (RfP) services. Ordo improves the financial wellbeing of businesses, social enterprises, charities, community groups, the public sector and individuals, by protecting them from payments fraud and helping them to be more in control of their finances, irrespective of who they bank with by enabling:

- Businesses to securely, simply and cost effectively request payments from their consumer and business customers. No requirement to store bank or card details or to pay high card fees – money arrives almost instantly no waiting to be settled. Invoices are traceable with a dialogue possible with the customer.
- Payers to securely and simply see what they've been asked to pay, trust who's asking, and then at the time of their choosing, use Open Banking to make their payments.
- Ordo takes advantage of the UK's Open Banking technology through an overlay of applications, web applications and standardized API interfaces.

CGI delivers innovative payment programs and solutions that support the entire payments value chain.

CGI Open Finance

CGI Open Finance is a complete solution for open banking, enabling the integration of traditional banks and their product-centric applications with FinTechs through an API and orchestration layer. More than that, CGI Open Finance supports the much wider set of non-functional requirements needed to operate an industrial strength, secure and resilient platform required for the new world of banking. It not only facilitates close collaboration with third party providers (TPPs), but also enables banks to become aggregators and provide the same services, driving real innovation. With CGI Open Finance, banks can maximize the benefits of open banking by offering new digital services and value-add partnerships to their customers.

CGI Open Finance offers clients the following:
- Out-of-the-box secure APIs for PSD2, CMA, STET, Berlin Group transactions, and beyond via a wide range of everyday banking functionalities (e.g. accounts, payments, mobile, etc.)
- Building blocks for the management of TPPs, including an enrollment portal, consent management and notifications
- Continuous integration platform for quality control, automated build and API testing
- Orchestration layer
- Platform for functional and technical monitoring
- Sophisticated analytics and smart security
- Access to API store
- Billing and monetization options

CGI HotScan360

CGI HotScan360 is a comprehensive and versatile risk management platform that provides real-time fraud detection, payments filtering, know your customer (KYC) and customer due diligence (CDD) capabilities, along with anti-money laundering (AML) transaction monitoring. With this complete enterprise financial crime platform, financial institutions can scan all of their customer transactions, activities and behavior in real time, score them and identify possible money laundering and fraud.

CGI HotScan360 Key Features and Benefits:
- Fraud detection, payments filtering, AML transaction monitoring and KYC/CDD capabilities
- All modules provided through a single solution, single implementation and single license
- Complies with the latest regulations
- High-performance, real-time risk engine that scans and scores thousands of transactions per second
- Self-learning rules and system improvement through ongoing suggestions for scenarios that increase the effectiveness of suspicious transaction detection and lower false positive rates
- In-memory databases with response times in milliseconds to fully support instant and online payments.
- Full data vertical coverage – from device identification to multi-channel big data analysis
- Covers all standard digital banking channels, as well as internal and external data sources through out-of-the-box interfaces
- Cost savings through more reliable risk detection using big data predictive and advanced analytics, along with machine learning models

CGI Solutions Enabling RTP Business
CGI All Payments

For clients looking to modernize their payments strategy and technology roadmap, CGI All Payments is a flexible platform that handles leading payment types – anytime, anywhere, regardless of the settlement and clearing network it's riding on.

Developed as a modern, integrated and flexible payment services hub, it offers everything you need to transform your payments environment into an efficient, full service, money moving operation that adds value for your customers and improves your bottom line.

CGI All Payments is:
- **Global** – Supports multiple currencies and languages, and as many payments channels as required worldwide
- **User-centric** – Provides an intuitive user interface with access to a set of dynamic dashboards and visibility into customized workflows; on-the-fly changes can be made to payments rules to ensure the rules are up to date, and operational staff can make adjustments directly
- **API-enabled** – Promotes back-office efficiencies and enhances the front-end experience for customers

- **Built for scalability** – Delivers on-demand performance you can count on, adjusting processing power to scale up instantly when you need it and reducing costs of increased capacity through efficiency gains
- **Cloud-enabled** – Supports full deployment across multiple ecosystems, either in the cloud or on premise
- **Smart and intuitive** – Enables workflow pattern matching and auto repair through process automation, improving STP
- **Flexible** – Provides options for adding or replacing only the payment functionality and clearing networks you require through a modular architecture
- **Secure** – Ensures the highest level of security through industry accepted approaches such as WSO2 Identity Server and Federated SSO via SAML2
- **Compliant** – Delivers ISO 20022 compliance out of the box, supporting needs today and the flexibility to meet future mandates

CGI All Payments is supported by end-to-end project management, software integration and tailored product support packages.
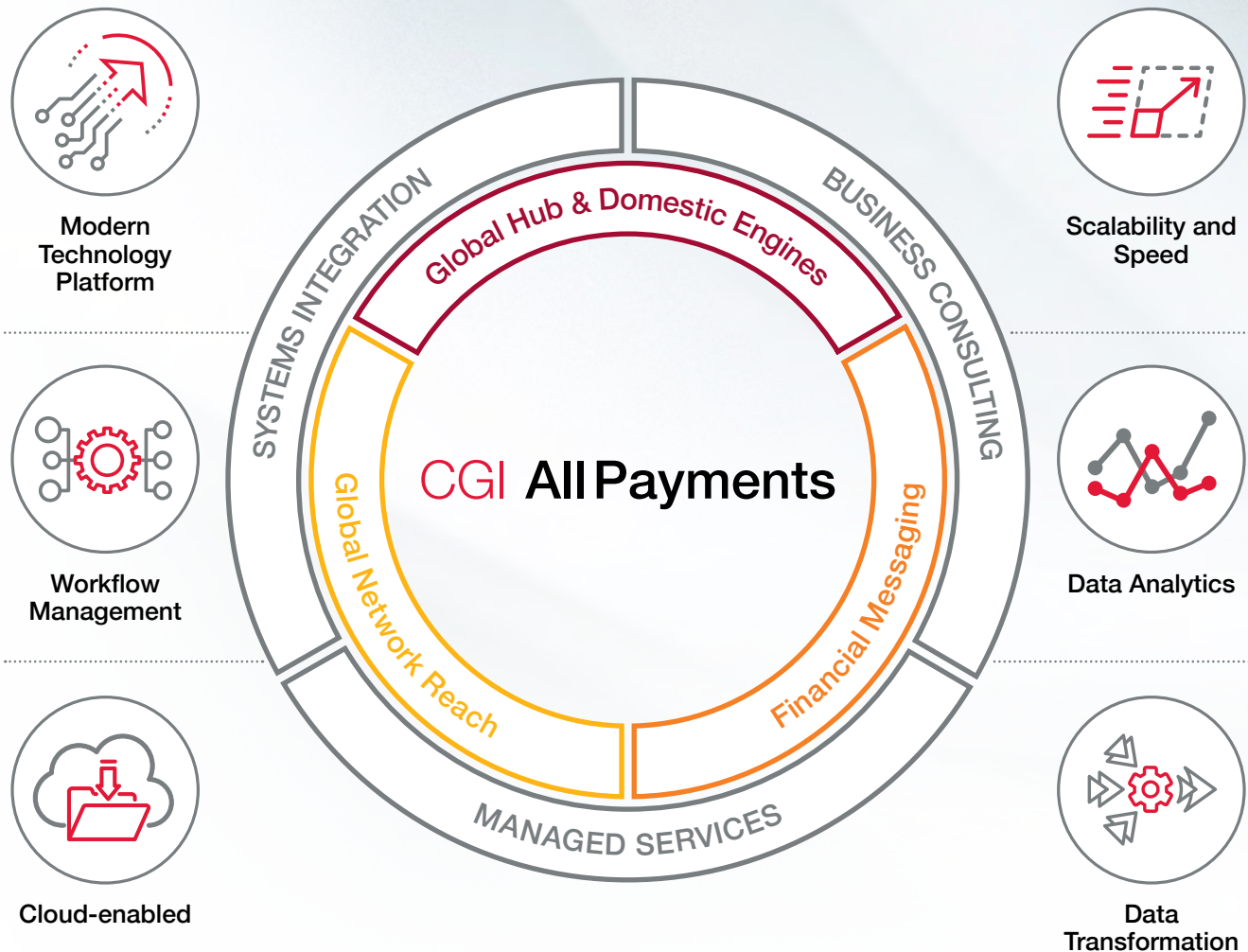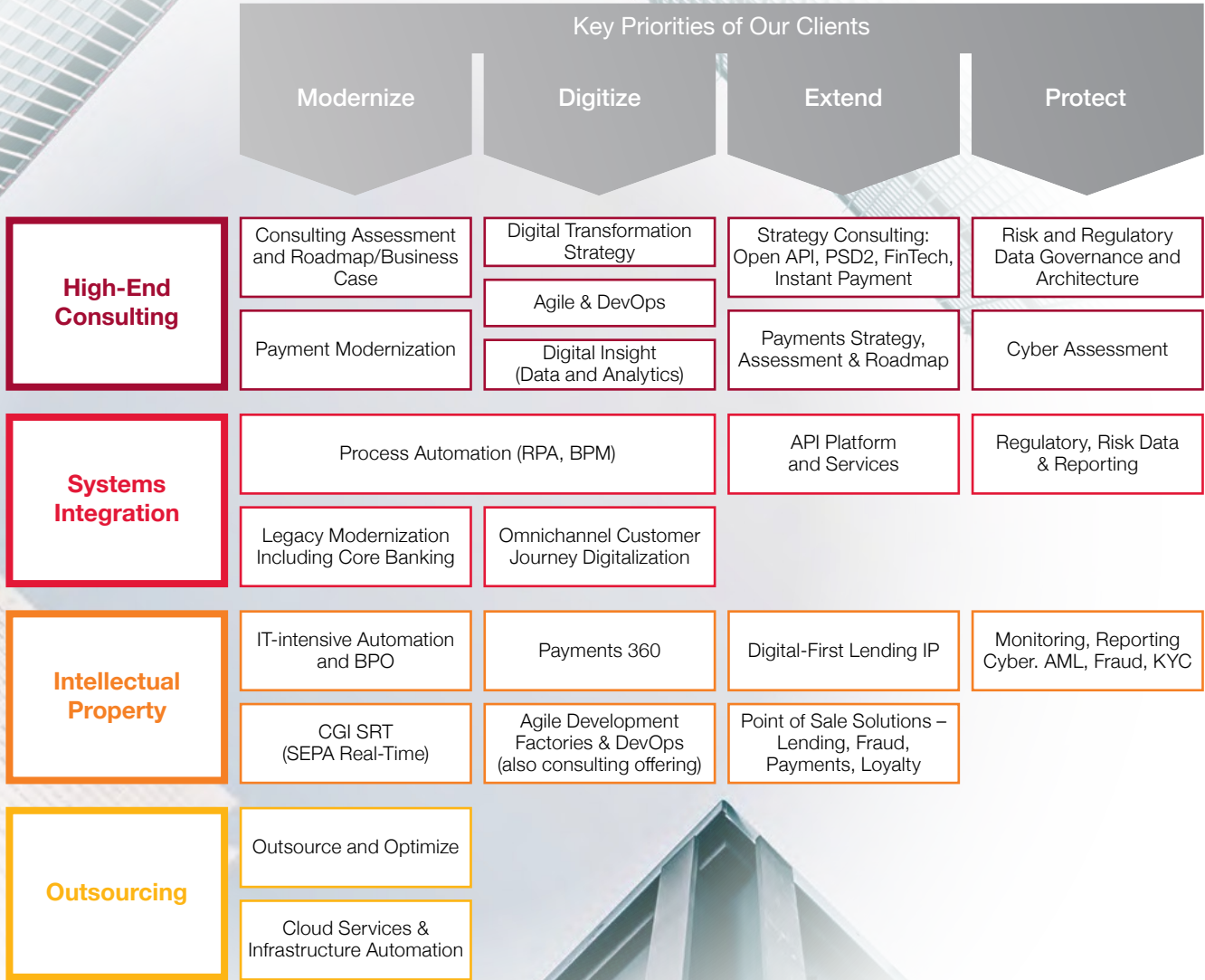

Figure 14: CGI All Payments

CGI Banking and Payments Portfolio

Key Priorities of Our Clients			
Modernize	**Digitize**	**Extend**	**Protect**

	Modernize	Digitize	Extend	Protect
High-End Consulting	Consulting Assessment and Roadmap/Business Case	Digital Transformation Strategy	Strategy Consulting: Open API, PSD2, FinTech, Instant Payment	Risk and Regulatory Data Governance and Architecture
		Agile & DevOps		
	Payment Modernization	Digital Insight (Data and Analytics)	Payments Strategy, Assessment & Roadmap	Cyber Assessment
Systems Integration	Process Automation (RPA, BPM)		API Platform and Services	Regulatory, Risk Data & Reporting
	Legacy Modernization Including Core Banking	Omnichannel Customer Journey Digitalization		
Intellectual Property	IT-intensive Automation and BPO	Payments 360	Digital-First Lending IP	Monitoring, Reporting Cyber. AML, Fraud, KYC
	CGI SRT (SEPA Real-Time)	Agile Development Factories & DevOps (also consulting offering)	Point of Sale Solutions – Lending, Fraud, Payments, Loyalty	
Outsourcing	Outsource and Optimize			
	Cloud Services & Infrastructure Automation			

References

1: Specifications for a standardisation framework, RTP MSG 005-19/ Version 1.0/ Date issued: 4 November 2019

2: http://www.w3.org/TR/payment-request

3: White paper Non-NFC based MobileSEPA Card Proximity Payments, EPC109-19 / Version 1.0 Date of publication: 7 June 2019, page 18

4: MIP OnLine - 2020, Crossing the chasm to the retail payments of tomorrow, January 2020 https://www.ecb.europa.eu/paym/intro/mip-online/2020

Team

Marc Bröking

Within the business consulting team of CGI, Marc Bröking runs the development of digital payment solutions. Topics such as instant payment, transaction processing of all payment methods, API management or service engineering play a special role. He sees himself as a "bridge builder" between the banking world and the retail payment ecosystem.

He represents CGI in the payments working group of the EHI Retail Institute and works in the expert group of the European Payment Council (EPC) on the development of SEPA Request-to-Pay and ISO 20022 RTP in Brussels, Belgium. Prior to joining CGI, he worked for First Data and held various management roles in card processing, merchant acquiring, and E-Commerce. Marc started his career in the payments industry as Head of Marketing at the acquirer Concardis and had been a member of Mastercard's marketing board in Germany.

✉ marc.broking@cgi.com

Thi Viet Hao Ha

Mrs. Hao has over 11 years of experience in the IT industry, particularly within the payments sector. Her specialties are requirement analysis and business processes. Mrs. Hao combines strong analytical skills and structural thinking.

Nelson Arias

Mr. Arias has more than 6 years of experience in the areas of finance, IT, transport and logistics. Mr. Arias specializes in evaluating current scenarios, identifying potential areas of improvement, and successfully delivering tailor-made solutions.

Kiran Dangeti

Mr. Dangeti is a high-end technical analyst, an API-expert, and data-scientist for payment flows and PSD2 conformity. Mr. Dangeti designs technical process flows and solutions to facilitate the integration of front-end and back-end APIs. Also, the Integration and implementation of statistical models, as well as data preparation and validation are part of his core competencies.

Founded in 1976, CGI is among the largest IT and business consulting services firms in the world. Operating across the globe, CGI delivers end-to-end capabilities, from strategic IT and business consulting to systems integration, managed IT and business process services and intellectual property solutions, helping clients achieve their goals, including becoming customer-centric digital enterprises.

CGI Deutschland B.V. & Co. KG
Am Limespark 2
65843 Sulzbach (Taunus)
T: +49 6196 7742-0
E-Mail: info.de@cgi.com
www.cgi.com/de

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