Opinion Paper on exploring the

Digital Customer Services Interface

EBA Working Group
on Electronic and Alternative Payments

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Executive Summary

Over the past decade, the advance of B2C and B2B commerce via (mobile) Internet has sparked new payment service providers to introduce innovative payment methods, referred to as electronic Alternative Payments (e-APs), both in a consumer/retail and business context.

As outlined by the electronic Alternative Payment Working Group (e-APWG) of the Euro Banking Association (EBA) in its "Opinion Paper on Next Generation Alternative Retail Payments: User Requirements"[1] on customer requirements, e-APs derive their success from addressing, among other things, the convenience and functionality ('conversion') gaps that are left open by traditional payment products and services from Account Servicing Payment Service Providers (AS-PSPs).

In its "Opinion Paper on Next Generation Alternative Retail Payments: Infrastructure Requirements"[2], the e-APWG highlighted that e-AP products and services lack 'reach' for consumers and merchants, having limited network effects due to a fragmented market. Cooperation between AS-PSPs and e-AP providers could provide reach and combine this with the excellent functionality ('conversion') capabilities that most e-APs have. This paper argues that the result of this cooperation could be the creation of the 'Digital Customer Services Interface' (DCSI), a 'virtual layer' on top of the existing SEPA and cards payment infrastructure.

Via such a pan-European DCSI protocol, real-time services for payment initiation, account information and digital identity (for B2C and B2B) can be offered by the AS-PSPs to the advantage of both the AS-PSPs and the e-APs. The e-APs can save (compliance) cost, easily onboard new customers and offer more reach and thereby enhance their market propositions towards consumers, merchants and other businesses. At the same time, AS-PSPs un-

lock new revenues by offering such API services on a pan-European scale, enhancing their own products and services.

For instance, consumers can benefit from new products and services that are made possible by the DCSI, such as combined account information from multiple banks. For merchants, interoperability implies that they can more easily penetrate the EU market with only a single AS-PSP or e-AP solution. Businesses can also benefit further by means of removing paper from their contracting, client service and communications.

Use cases of the DCSI include e-AP to e-AP real-time reachability, e-AP to SEPA payments (and vice versa) and easy digital onboarding and contracting of consumers and merchants by re-using online banking credentials (digital identity). Also, information services are in scope, e.g. the aggregation of bank account information of consumers and businesses. The DCSI also has the potential of enabling AS-PSPs to comply with the upcoming 'access to account' requirements as stipulated in the draft PSD2.

The present opinion paper advances previous thought leadership work on the DCSI concept by describing the core concept, its key use cases (including mobile real-time instant payments) and possible ways forward for the industry. An acceleration of the digital economy is foreseen when the financial industry succeeds in creating the next level of digital interfacing.

Objective of this paper

During the first half of 2014, the electronic Alternative Payment Working Group (e-APWG) of the Euro Banking Association (EBA) summarised in an "Opinion Paper on Next Generation Alternative Retail Payments: User Requirements" that third parties are increasingly offering e-AP alternatives to retail and commercial payment services provided by AS-PSPs in. The EBA initiated a coordinated effort to gain a

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[1] EBA Working Group on Electronic Alternative Payments, Opinion Paper on Next Generation Alternative Retail Payments: User Requirements, Version 1.0, 13th May 2014.

[2] EBA Working Group on Electronic Alternative Payments, Opinion Paper on Next Generation Alternative Retail Payments: Infrastructure Requirements, Version 1.0, 15th December 2014.

better understanding of the e-AP landscape as well as drivers for this service domain and to identify potential opportunities for the financial industry to add value.

The following opinion paper published in December 2014, "Opinion Paper on Next Generation Alternative Retail Payments: Infrastructure Requirements", looked at the potential impact of the growing e-AP domain on payment infrastructure requirements from a payment practitioner's perspective. The key insight is that e-APs lack reach towards consumers and merchants. AS-PSPs and e-AP providers can realise this reach together by creating the 'Digital Customer Services Interface' (DCSI) on top of the existing SEPA and cards infrastructure.

As a next step, the present paper is aimed at facilitating a discussion on how the DCSI can enhance the online commerce possibilities of the industry players. It focuses on the different use cases that are made possible by the DCSI and the benefits this entails for all parties involved. After defining and scoping the potential of the DCSI, the paper suggests an approach for the financial industry to make this interface between AS-PSPs, e-APs, merchants and consumers a reality.

Reading guide

The first section will take stock of earlier work and summarise the necessity for and conception of the DCSI.

In section 2, the four generic use cases of the DCSI are explained, which show how communication between AS-PSPs and e-APs can create new business models for both parties. Also, this section shows how interoperability between the AS-PSPs' online banking solutions and e-APs can enhance the possibilities for merchants to conduct business. Finally, it shows the specific benefits for AS-PSPs, e-APs, consumers, merchants and business-to-business transactions.

In section 3, the specifications of the DCSI are discussed. As the DCSI will enable sensitive and valuable information to be transferred from one AS-PSP or e-AP to another, criteria for adherence to the DCSI and rules for conduct for access to the DCSI are of vital importance. Also, the decentralised network model of the DCSI is explained.

Section 4 lists next steps, focusing in particular on the process that this paper suggests to be followed in order to realise the DCSI. The set-up steps and suggested stakeholders are listed as well.

1. EVOLUTION OF THE DIGITAL CUSTOMER SERVICES INTERFACE (DCSI)

1.1 Enabling conversion with reach for customers

The EBA e-APWG "Opinion Paper on Next Generation Alternative Retail Payments: Infrastructure Requirements"[3] introduced the Digital Customer Services Interface (DCSI) as a solution to bridge the gap between electronic Alternative Payments (e-APs) and the traditional AS-PSPs infrastructure.

Currently, e-APs operate on top of the existing interbank payment infrastructure (SEPA and cards) within the Internet domain (**Figure 1**). In this model, e-APs offer high convenience and functionality leading to increased conversion of the sales process, but suffer from limited reach due to the fragmented market. In contrast, AS-PSPs offerings provide high reach but

have lower conversion due to lower convenience and functionality induced by cumbersome steps within the payment process. The e-APs have proven themselves to be an alternative for solutions offered by AS-PSPs.

As new players in the financial industry, e-APs have added innovative, online payment methods and products to the finance industry, positioning themselves between the consumer and the merchant. As such they have taken over a high portion of the contact customers traditionally have had with the AS-PSPs. This concept has been described as: 'the internet is a mechanism for disintermediation'[3].

And so, as their customers experience that it is less necessary to involve the AS-PSPs when making payments, the contact frequency between the AS-PSPs and their customers reduces and AS-PSPs start to experience disintermediation from their customers.
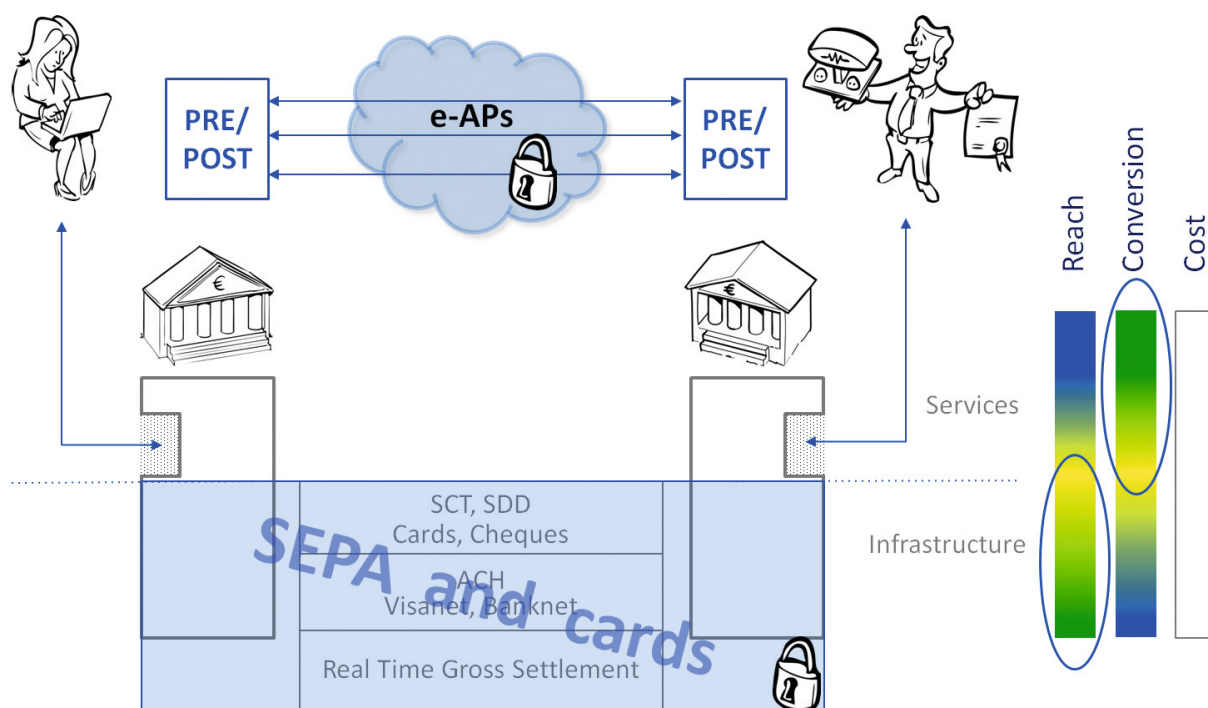

Figure 1: *Disconnection between the current e-AP and AS-PSP market*

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[3] R. Gellman, Disintermediation and the internet, Government Information Quarterly, volume 13, issue 1, p.1-8, 1996.

As introduced in the previous opinion paper[4], the DCSI can offer a potential solution for both the lack of conversion of the AS-PSPs' solutions and the e-APs' lack of reach. By facilitating interoperability between the e-APs and the AS-PSPs, the DCSI allows both parties to use each other's strength towards serving their customers (both merchants and consumers) better.

As a result of this interoperability, AS-PSPs can also bring their own e-AP products and services to the market, in either payment initiation services, account information services and digital identity services, such as online contracting and identity verification.

As a final note, the DCSI can also potentially enable AS-PSPs to comply with the upcoming 'Access to the Account' requirements as stipulated in the draft revised version of the Payment Services Directive (PSD2).

1.2 PSD2: DCSI can facilitate PSD2 compliance for AS-PSPs

Over the last few years, evolution in the payments market has brought forth new services and providers, especially in internet payments. The current situation is that the market is fragmented and there are legal uncertainties regarding liabilities, potential security risks in the payments value chain and lack of customer protection. The proposed PSD2 intends to address these gaps through additional rules and standardisation to harmonise the regulatory framework. This will in turn encourage the digital economy, enhance competition, and guarantee higher consumer protection[5]. The PSD2 will replace the existing PSD[6], which came into force in late 2007.

The most debated parts of the PSD2 are related to the provisions on '*access to account*' (XS2A), in addition to other proposed changes concerning surcharging, refund right, non-discriminatory access to payment systems/accounts, security and customer authentication.

The PSD2 introduces new regulated roles in the payment ecosystem, generally referred to as 'Third Party Providers' (TPPs), which in particular are Payment Initiation Service Providers (PISP) and Account Information Service Providers (AISPs). In the present opinion paper, the so-called e-AP providers fall within the category of TPPs, though not exclusively.

XS2A is requesting AS-PSPs to grant TPPs 'open and non-discriminatory' access to a consumer's payment account, when the consumer has provided the TPP with explicit consent. This allows e-APs to initiate a SEPA Credit Transfer (SCT) and/or retrieve account information, i.e. referred to as Payment Initiation Service (PIS) and Account Information Service (AIS) respectively.

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[4] EBA Working Group on Electronic Alternative Payments, Opinion Paper on Next Generation Alternative Retail Payments: Infrastructure Requirements, Version 1.0, 15th December 2014

[5] PSD2: Proposed Directive of the European Parliament and the Council on payment services in the internal market. Available at: http://register.consilium.europa.eu/doc/srv?l=EN&f=ST%2013149%202014%20INIT

[6] PSD: Directive 2007/64/EC of the European Parliament and the Council on payment services in the internal market. Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32007L0064&from=EN2007/64/EC

Regulated & non-regulated services

The new regulatory framework defined in the proposed PSD2 forces AS-PSPs to grant TPPs, defined in two new regulatory roles, access to a customer's payment account to conduct a Payment Initiation Service (PIS) and/or an Account Information Service (AIS). The new regulatory roles in the payment ecosystem are referred to as the Payment Initiation Service Provider (PISP) and the Account Information Service Providers (AISP). A PISP is allowed to request an AS-PSP to initiate a payment, i.e. resulting in a confirmation from the AS-PSP if the consumer has sufficient funds to execute a given transaction. An AISP is allowed to request account information from a user's designated payment accounts and associated payment transactions held at one or more AS-PSPs. An illustration of the regulated domain of XS2A is shown in **Figure 2**.

Figure 2: *Regulated domain of XS2A*

The final scope of the XS2A regulation is still very much debated as part of the trilogue discussions between the European Council, the European Commission and the European Parliament (April 2015). Regardless of the outcome of this discussion, it seems clear that a minimal set of services for 'open access' will be part of PSD2. Beyond this basic set of payment (i.e. PIS) and non-payment (i.e. AIS) services, there is room for the AS-PSPs and e-APs to develop compelling AIS and PIS based on individual API business strategies and commercial products and services, i.e. outside the scope of PSD2. The DCSI offers the opportunity to combine PSD2 compliance with a broader scope of new, compelling services for consumers and merchants.

2. CREATING END-TO-END INTEROPERABLE TRUST THROUGH THE DCSI

The e-APs that form the services layer are created by e-APs and AS-PSPs alike. The Online Banking & electronic Payment (OBeP) schemes that are created and maintained by regional AS-PSPs are a good example of these e-Aps, e.g. iDEAL in the Netherlands, Giropay in Germany and the pan-European MyBank solution, also referred to as 'four party models' or 'networks'. Other examples are more of the 'three party' or 'platform' nature, e.g. PayPal, PayU, Skrill and the various 'monobank' OBeP solution, where AS-PSPs offer a direct pay button to initiate a SCT.

To make direct transactions between different e-APs and AS-PSPs possible, the DCSI needs to facilitate trusted connectivity between both schemes and platforms, leveraging the financial reach created by the harmonised SEPA infrastructure. This implies that the creditor bank issuing the payment request on behalf of the merchant, needs to be able to call on a debtor bank to acquire a payment authorisation (from a consumer that prefers to pay via a different scheme). Similarly, transactions between e-AP platforms require the same connectivity. Hybrid variants are also conceivable, in which a merchant wishes a payment to be credited to his e-AP account, receiving the payment confirmation from an OBeP scheme and vice versa. The use cases described in chapter 2.2 explain these types of connectivity in more detail.

2.1 API technology as the basis for DCSI

The DCSI operates as a standardised interface between AS-PSPs and e-APs. In this way, it creates a (mostly) virtual infrastructure in which these two parties communicate through a trusted access to one another's customer data. This infrastructure is realised with trusted machine-to-machine API-interfaces based on common agreements on standards and protocols among financial institutions.

Application Programming Interface (API)

An API is a technology concept that allows software applications to communicate without human intervention. An API specifies: a mechanism to connect to the software, what data and functionality is available, and a set of rules (standardisation) that other software applications have to follow to access data and functionality. This set of rules also describes which data is accessible and what functionality is available (e.g. read-only/changeable). External APIs that are accessible for external parties, allow third parties to easily build their own software implementation 'on top of' the API without compromising the data/functionality and other implementations[7].

An API can be compared to the introduction of the ship container standard. Before ship containers were standardised, every ship had to be loaded and unloaded in a different way. Nowadays, because both land- and water-based parties have agreed on a standard for containers (ships are designed for handling these standard-size containers, as are cranes and trucks) (un)loading is faster and reduced in cost. The equivalent of the ship in our example is the API carrying data and the software implementations (which can be transferred) would be the ship container (which is transferred to different harbours). Functionality would be viewing or changing the contents of the ship container.

Examples of API providers are Twitter, Google Maps and Facebook. PayPal already has had an API within the payments domain since 2010[8]. Amazon and Salesforce have built a global business around APIs, enabling other providers to develop services 'on top of' their infrastructure. Examples include logging in, database access (e.g. for posting) and information display (feed). Most API services are free but some charge a fee per request.

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[7] HM Treasury and Cabinet Office, Data Sharing and Open Data for Banks, Report, September 2014, p.14-22. Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/382273/141202_API_Report_FINAL.PDF

[8] PayPal API. Available at: https://developer.paypal.com/webapps/developer/docs/api/

A schematic overview of the Twitter API interface is shown in **Figure 3**. Multiple users can interact with the Twitter database, e.g. share/tweet posts from other social media and platforms with different devices directly. Other trusted third parties have built new products and services 'on top of' the API such as the possibility to purchase Twitter followers, or show detailed analytics by utilising the massive amount of available data. Twitter has benefited from the API-ecosystem by acquiring several companies that started a successful new product or service using the Twitter API. Two examples are TweetDeck which enables a user to organise everything happening on Twitter, and Bluefin Labs which provides TV analytics based on social media activity.
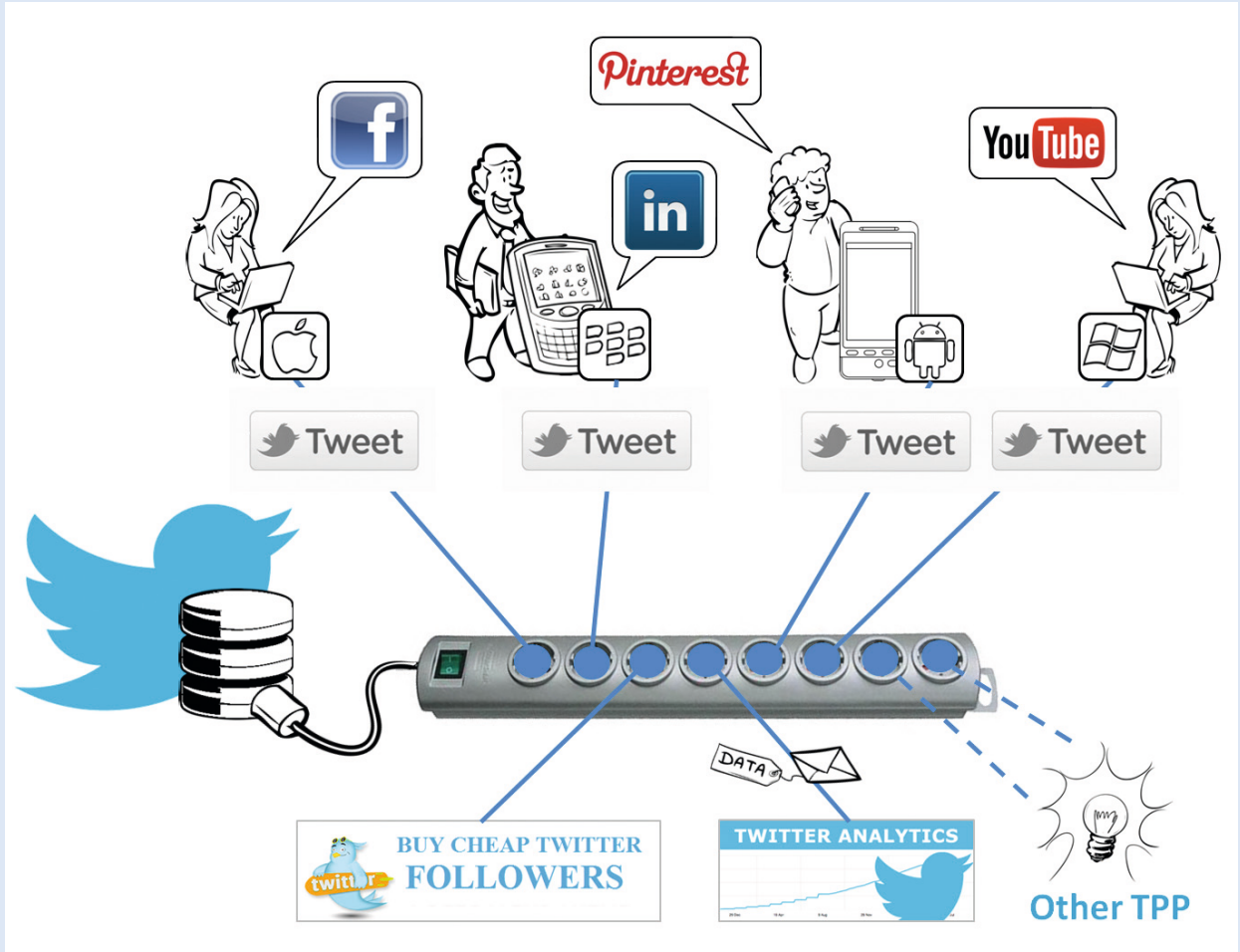

Figure 3: *Twitter API interface*

In this context, the DCSI can be visualised as a serial socket, as in **Figure 4**. It offers a place for the API calls that unlocks AS-PSP's functionality towards e-AP.
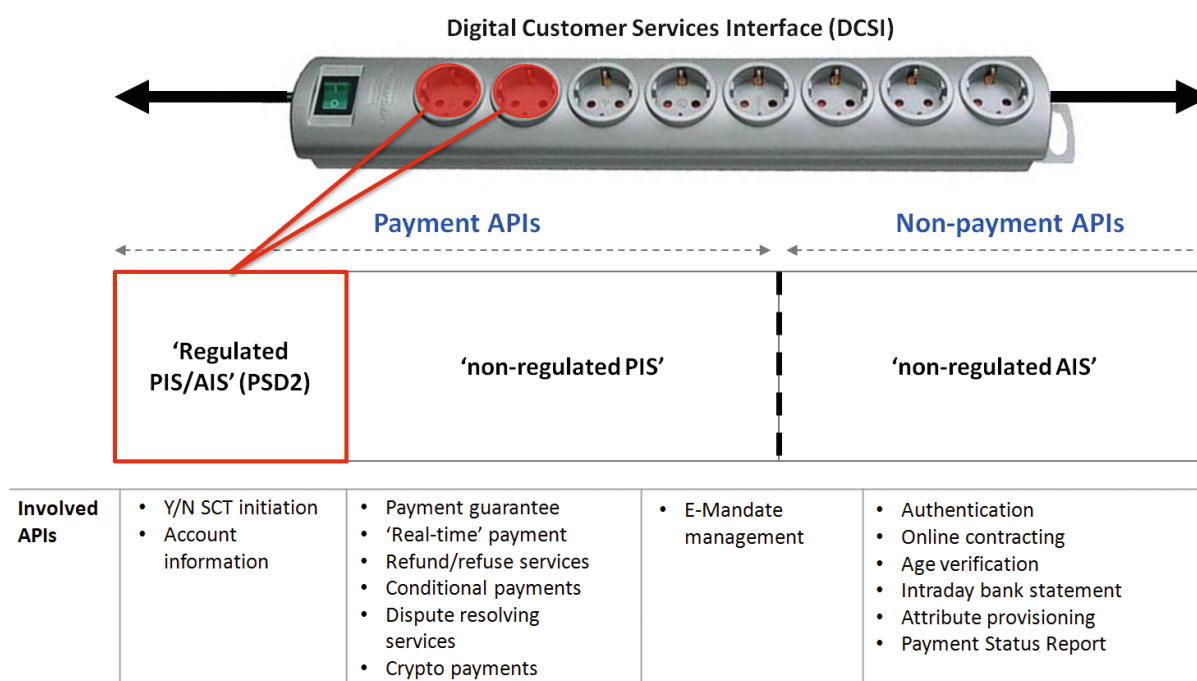
Figure 4: *Anatomy of the Digital Customer Service Interface (DCSI)*

Figure 4 shows that the market for interoperable AS-PSPs and e-APs interaction goes far beyond payments and can better be categorised as services for payments, account information and digital identity. Opportunities associated with e.g. digital identity are discussed in detail in the "Opinion Paper on Digital Identity: 'From check-out to check-in'"[9].

2.2 The four generic use cases for the DCSI

As mentioned above, the DCSI allows interoperability between AS-PSP's online solutions with e-AP solutions, as well as between e-APs. This gives a total set of four generic use cases as shown in **Figure 5**. It should be noted that the DCSI works 'on top of' of the SEPA infrastructure. The DCSI is therefore a real-time messaging interface and clearing and settlement is done in the traditional way within the SEPA infrastructure. In the past year the creation of a pan-European real-time clearing and settlement infrastructure has become a major topic of interest for regulators, vendors and AS-PSPs.

The DCSI must also be seen in the light of this important development because the benefits of a real time clearing and settlement infrastructure have to be brought to the consumers and merchants, either by the AS-PSPs directly or through e-APs. API technologies as intended by the DCSI are instrumental in creating the real-time customer experience, which is mainly defined by the messaging part of payment transactions. Recent research[10,11] highlights the role of messaging in the domain of 'instant payments'.

[9] EBA Working Group on Electronic Alternative Payments, Opinion Paper on Digital Identity: 'From check-out to check-in', 13th May 2014.

[10] SWIFT, Real Time Payment, Presentation, Nordic Regional Conference, Copenhagen, March 2015. Available at: http://www.slideshare.net/SWIFTcommunity/payments-streamrealtimepayments

[11] Federal Reserve System, Strategies for Improving the U.S. Payment System, Report, Jan 2015, p.38-39. Available at: https://fedpaymentsimprovement.org/wp-content/uploads/strategies-improving-us-payment-system.pdf
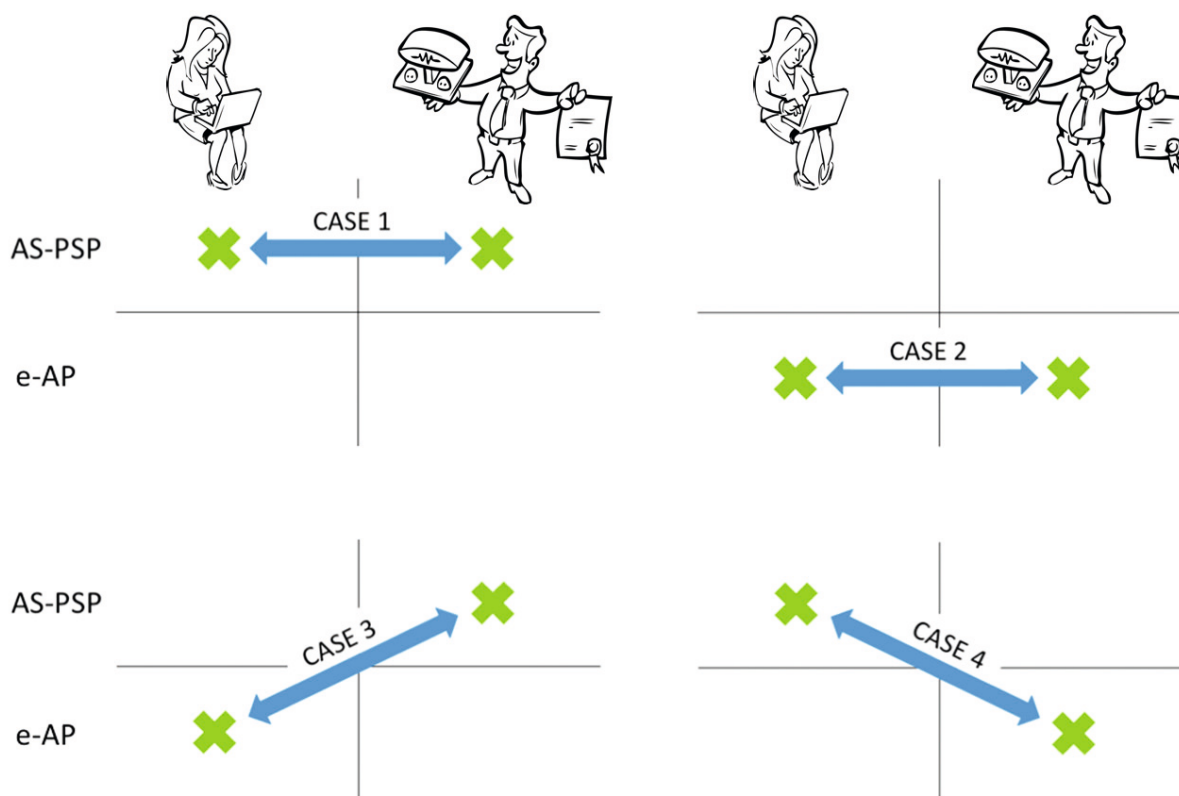
Figure 5: *The four generic use cases for the DCSI*

All use cases describe the process between a consumer and a merchant interacting with their AS-PSPs and e-APs that adhere to, and are connected to the DCSI, with regards to *payment initiation*, *account information* and *digital identity* transactions. Case one is the interaction with the DCSI between two AS-PSPs, case two is the interaction between two e-APs, and case three and four involve interaction between an e-AP and AS-PSP and vice versa. It is important to note that the use cases are illustrative in a sense that they are only examples in both payments and non-payments applications, and by no means cover the entire spectrum of possibilities that can be facilitated with the DCSI.

2.2.1 Case 1: AS-PSP to AS-PSP
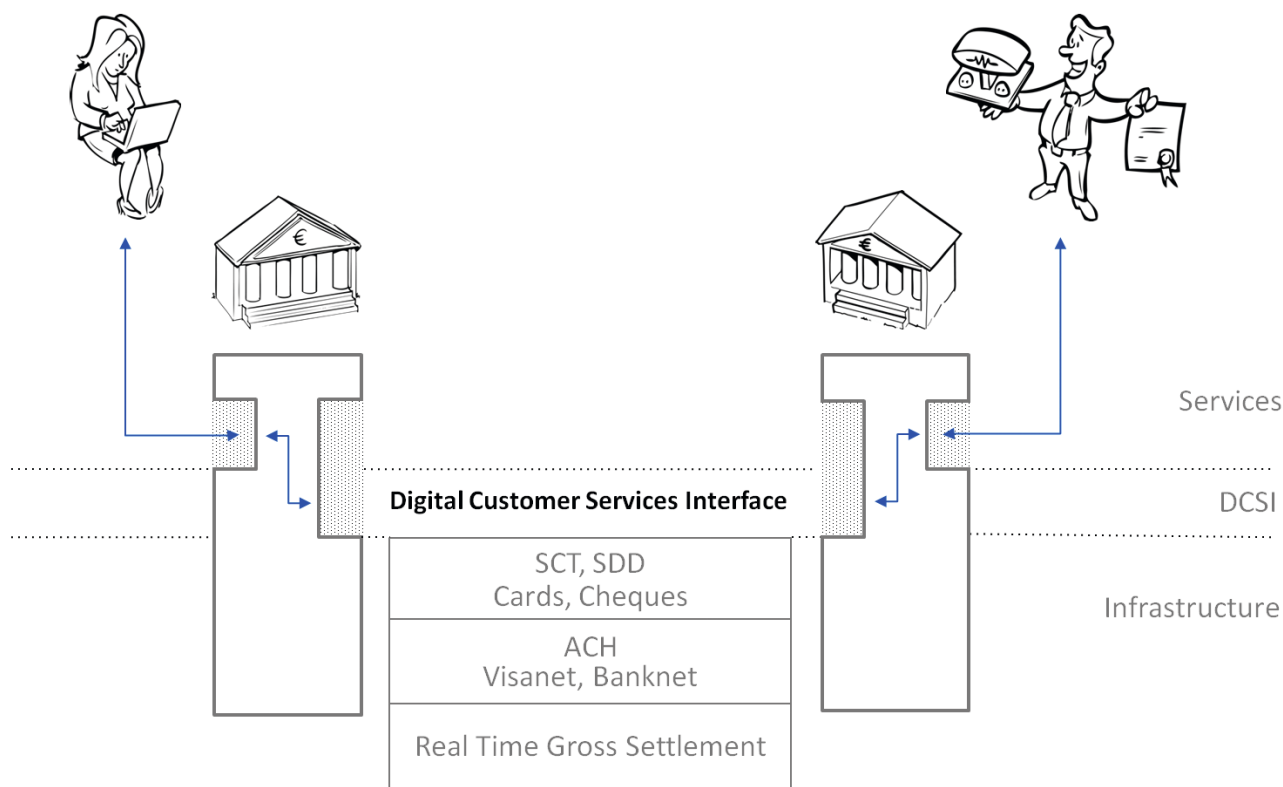
Figure 6: *AS-PSPs interoperability through the DCSI*

The DCSI provides interoperability between AS-PSP's financial services, such as omni-channel banking, card and digital identity solutions, as depicted in **Figure 6**. This allows for easy omni-channel pan-European payments, offering of non-payment services such as online identity and new products and services such as aggregated accounts.

2.2.1.1 Payment initiation

In Europe, AS-PSP communities offer Online Banking e-Payment (OBeP) schemes, which are typically active in a single member state (with the notable exception of the pan-European MyBank scheme). Through AS-PSP interoperability it is possible for separate OBeP schemes to link together, which allows merchants to receive online payments from different schemes in different member states.

2.2.1.2 Account information

If customers (consumers or merchants) hold bank accounts at multiple AS-PSPs, then these accounts need to be managed separately. Specialised financial software can be used to aggregate the account information and manage these accounts, but such software can be expensive and difficult to use. With the DCSI, AS-PSPs can offer to retrieve the account information from other AS-PSPs and offer the aggregated overview in their online banking environment.

2.2.1.3 Digital Identity

In much the same way as with the payment initiation described in 2.2.1.1, AS-PSPs can link local digital identity schemes together. An example of how this could benefit their customers is that a Swedish PSP customer could use the local Swedish BankID e-identity scheme to sign an online contract for a rental car in Italy, at a car rental company that uses a local or pan-European e-identity solution.

2.2.2 Case 2: e-AP to e-AP
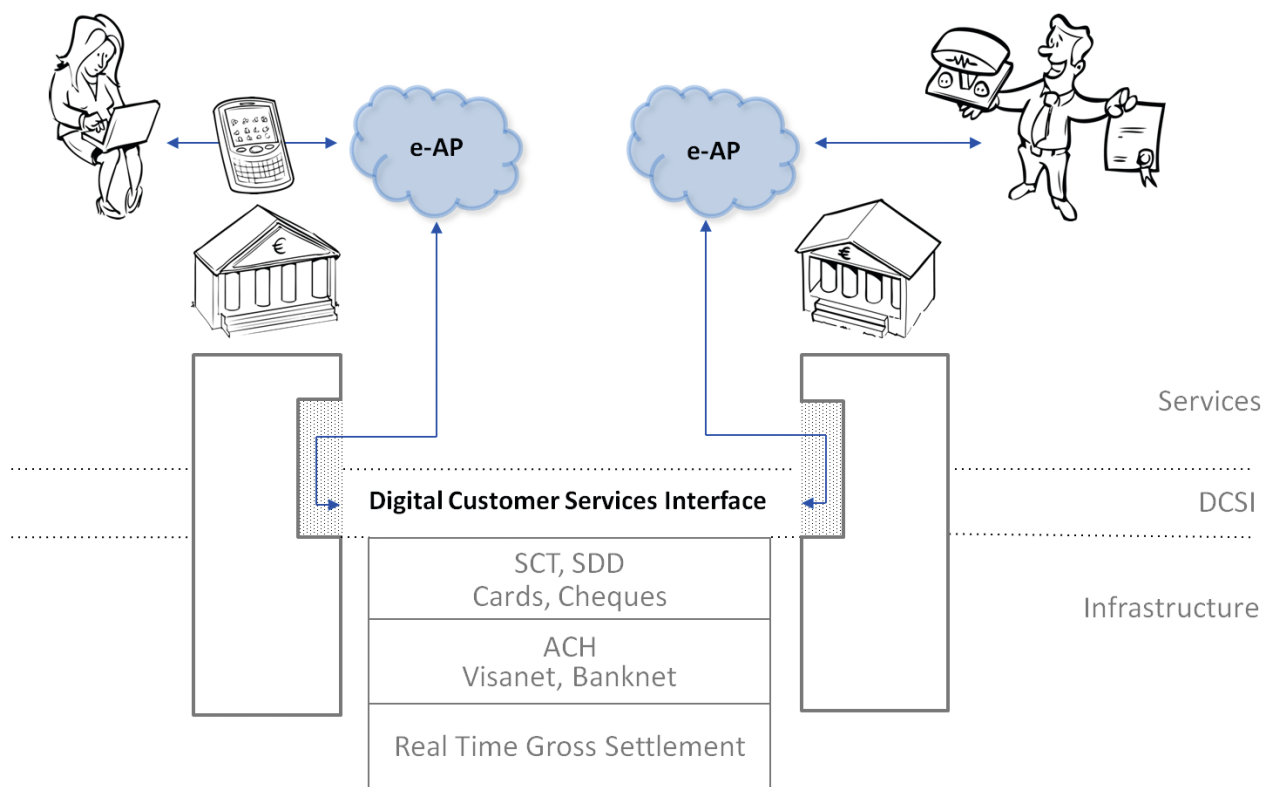
Figure 7: *Interoperability between e-APs through the DCSI*

The DCSI is accessible for e-APs as shown in **Figure 7**. In this way, the DCSI facilitates interoperability between e-APs by offering a central adherence registry, which contains all parties that have registered as part of the DCSI.

2.2.2.1 Payment Initiation

E-AP platforms typically do not allow payments to be made outside their own platform. Both consumer and merchant need an account at the same e-AP in order to allow a payment to be completed. Using the DCSI this limitation is no longer necessary. One of the possible applications of e-AP interoperability is for different e-AP services to facilitate payments to mobile numbers and e-mail accounts.

2.2.2.2 Account Information

In much the same way as described in 2.2.1.2 (AS-PSP to AS-PSP account information aggregation), e-APs can use the DCSI to aggregate account information from multiple platforms, allowing their customers to gain an overview of their balances in their selected platforms.

2.2.2.3 Digital Identity

Sharing of login credentials is commonplace on the Internet. Especially the 'logon with Facebook' button is an often-used feature for sites to make customer enrolment easier. Such forms of digital identity are usually not backed by customer due diligence processes in which AS-PSPs have invested. Therefore, the level of assurance of the digital identity is lower then the digital identity proposition of the AS-PSPs. However, such cooperation between e-APs would make it possible for them to aggregate attributes, which helps them to make more appealing propositions to their customers.

Real-time mobile peer-to-peer payments
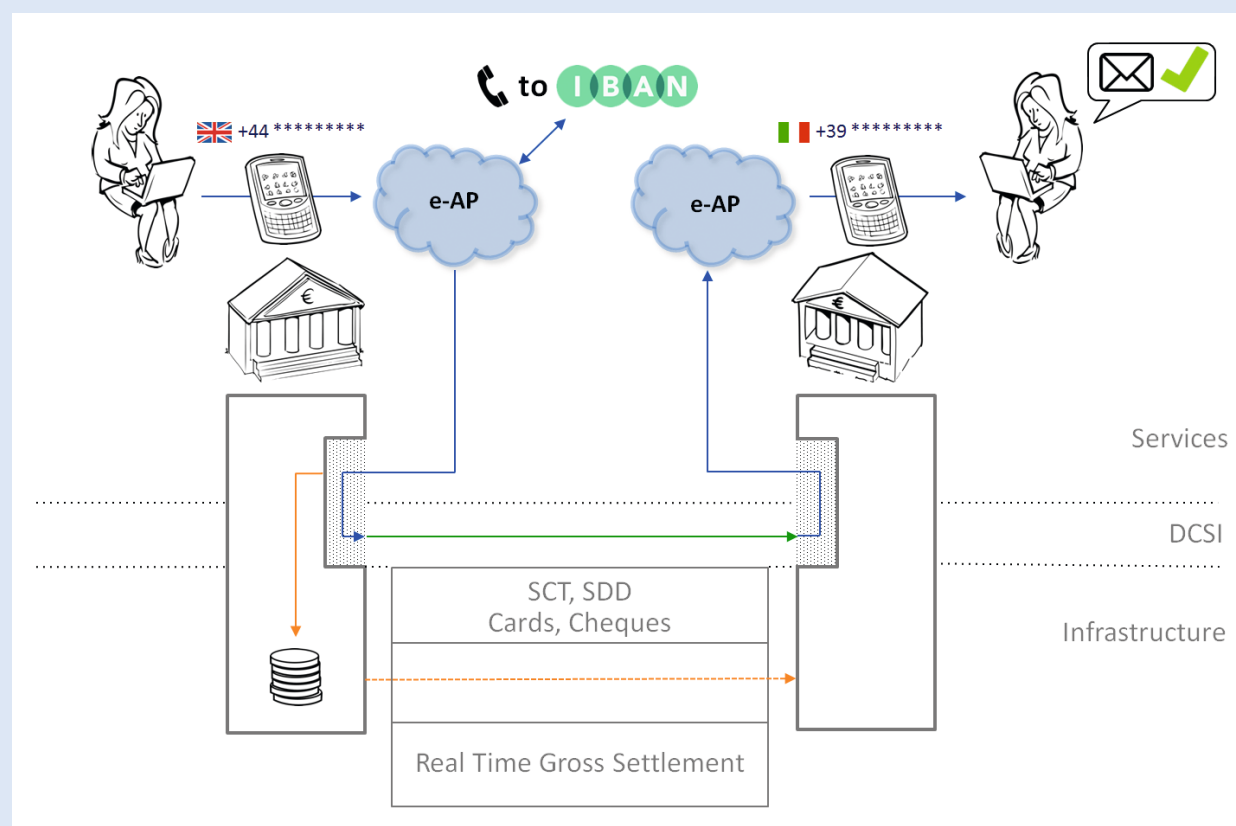
Figure 8: *Real-time pan-European confirmation by e-AP interoperability*

One compelling application of the DCSI is 'real-time' pan-European peer-to-peer payments via mobile devices as shown in **Figure 8**. These pan-European payments do not exclude foreign exchange. It is a currency-agnostic protocol; however, the service for the exchange itself is not available within the DCSI. Depicted in the above figure is a person in the UK making a payment to a peer in Italy via a mobile application. This is achieved by sending the amount and the receiver's mobile number[12] to the receiver's e-AP application. The e-AP provider obtains the IBAN from the mobile number via a trusted third party and sends payment information via the DCSI to the receiver's e-AP provider. On the receiver's end, the payment shows up once the message is sent from their e-AP provider. Both peers receive real-time information in the services layer, that is, they receive real-time confirmation of the payment. The funds become available once clearing and settlement in the infrastructure layer has been completed, typically the day after payment initiation, in the case of a cross-border SEPA payment. Of course, this would become 'real-time' once instant payments are a reality.

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[12] The mobile number could also be an e-mail address or in fact any identifier that can be linked to an IBAN. Theoretically, the payment can even be completed between e-mail accounts.

2.2.3 Case 3: AS-PSP to e-AP
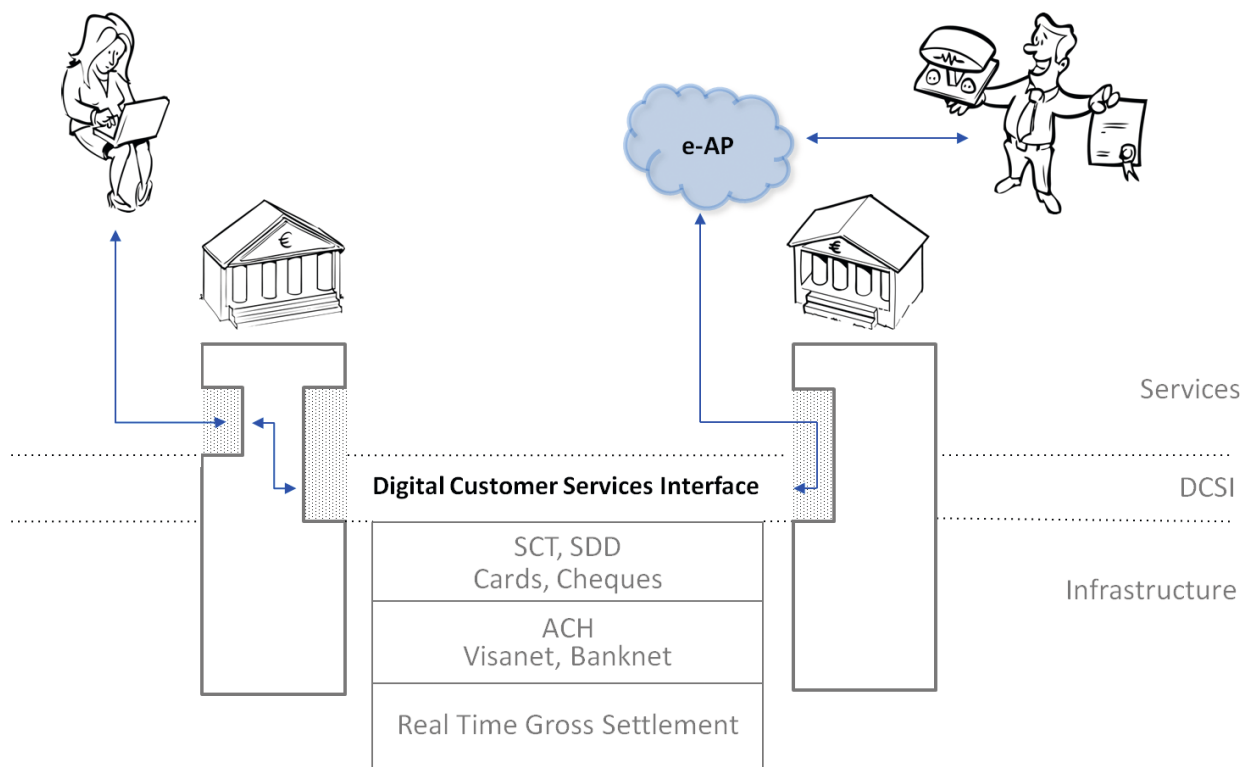
Figure 9: *OBeP and e-AP interoperability*

As shown in **Figure 9**, interoperability between AS-PSPs and e-APs allows both parties to gain access to each other's strengths. In this use case, the consumer uses his account at an AS-PSP to communicate with a merchant that uses an e-AP solution.

2.2.3.1 Payment initiation

The DCSI makes it possible for consumers to make a transaction from their AS-PSP's online environment to the e-AP that a merchant prefers to receive payments on in 'real-time'. Furthermore, if an account at an AS-PSP is linked to an account at an e-AP that uses a different (non-bank) kind of receiving account, payments can potentially be performed to a non-IBAN, e.g. mobile number, e-mail address or any other identifier.

2.2.3.2 Account information

In order to help their customers gain a complete insight in their financial position, AS-PSPs can offer a complete overview of all online payment accounts that the customer holds. Potentially, this could include the balance on crypto-currency wallets as well.

2.2.3.3 Digital identity

Because AS-PSPs have verified information of account holders with a high level of assurance, the e-APs can benefit from this service in their own business models. For example, if a trusted third party requires online age verification, the consumer can be re-directed to the web portal of their AS-PSP to gain the AS-PSP's confirmation that the customer is of adequate age for the online service requested.

2.2.4 Case 4: e-AP to AS-PSP
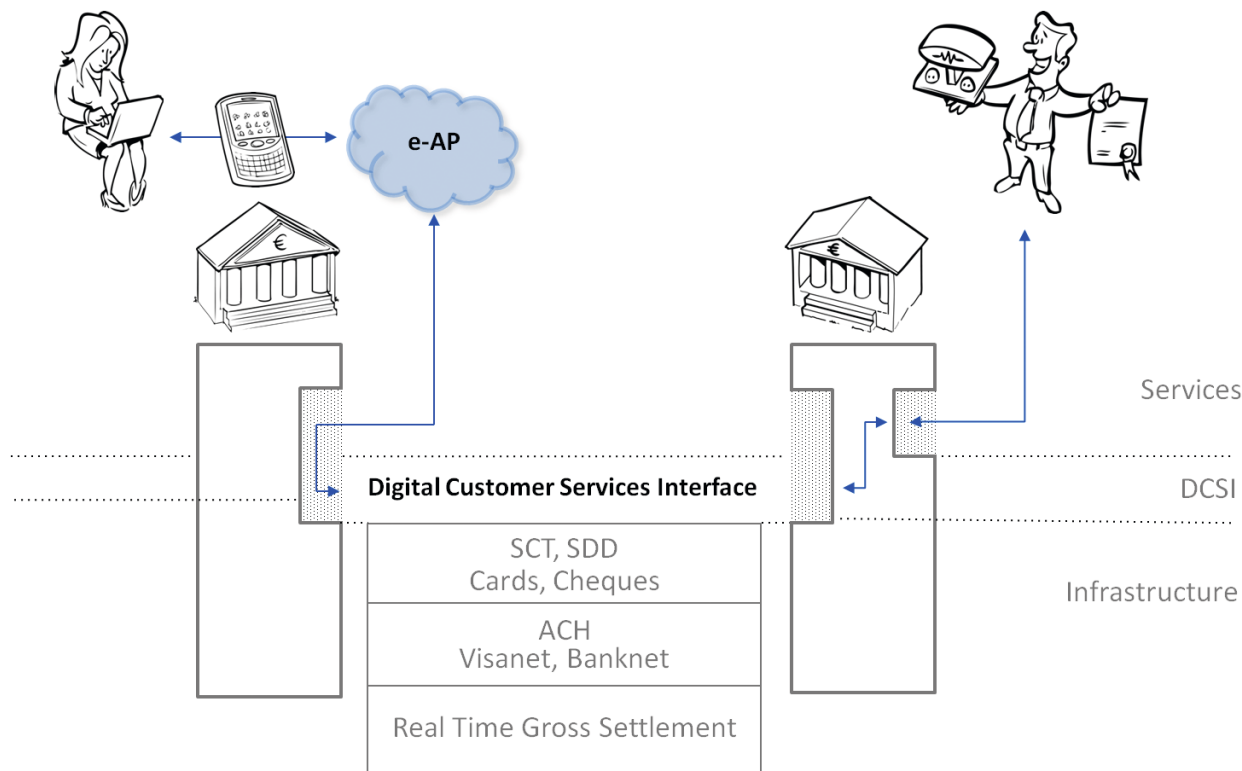
Figure 10: *E-AP and OBeP interoperability*

This use case is similar to that of case three and is shown in **Figure 10**, as it facilitates communication between e-AP and AS-PSP. In this use case, the merchant holds an account at an AS-PSP and the consumer wishes to use his or her e-AP account.

2.2.4.1 Payment initiation

The possibility for consumers to make a payment with their e-AP to the merchants account at their AS-PSP's OBeP solution allows merchants to increase the scale of payment reception to include the e-AP's features like non-currency valuables, such as crypto-currencies, loyalty points or any other commodity that represents value.

2.2.4.2 Account information

By accessing the account history of the customer's account at an AS-PSP, an e-AP can offer more insight into the client's financial situation in much the

same was as AS-PSPs can, as described in paragraph 2.2.3.2.

2.2.4.3 Digital identity

A merchant could ask a consumer to access his web shop using an account the consumer holds at an e-AP. Such a digital identity service is similar to the one described in 2.2.3.3, although the level of assurance of such an identity validation would depend on the depth of customer due diligence that the e-AP has undertaken.

2.3 Benefits of the DCSI

The DCSI connects the e-APs services to the infrastructure of the AS-PSPs which allows both sides to benefit from each other's strengths. It facilitates interconnection between the high conversion of e-APs (due to high functionality and convenience) with the

high reach and trust of AS-PSPs. This interconnection allows both AS-PSPs and e-APs to create new (e-AP) products and services, or start joined products and services.

In this way, the DCSI has a beneficial effect for all parties involved, as real-time information exchange, faster product innovation and increased competition for e-/m-commerce services will strengthen the entire value chain. Therefore, the DCSI is a perfect complement to the real-time payments initiative that helps faster movement of funds.

Real-time payments or real-time commerce?

In the previous e-APWG opinion paper "Opinion Paper on Next Generation Alternative Retail Payments: Infrastructure Requirements", different ways of creating a real-time payments experience were discussed. Real-time payments are still a hot topic for payment professionals, policy makers and regulators. The real-time 'money on the account' product and service is enticing, since it removes a common frustration of merchants, who need to wait for the SEPA Credit Transfer to clear and settle, lagging behind the 'online payment', or 'information about the payment' that was confirmed in near real-time during the online purchase. This SCT can, in case of banking holidays and weekends, take several days to clear.

The DCSI can add a messaging channel for the underlying payments to an already enticing potential of real-time payments. This combination might well be labelled as 'real-time commerce' due to the non-payment services in the DCSI, like real-time identity confirmation or online contracting. Such combinations of real-time payments with real-time information provision can offer a complete and compelling suite of services for merchants to build their commercial products and services on.

By offering a governed, standardised means of connecting AS-PSPs to the e-APs, the confidentiality, integrity and availability of the personal data used in the transaction is assured to a high degree. As a result, the trust in the e-commerce industry as a whole will grow, which will benefit the entire European economy.

In short, the DCSI offers security and privacy on a *technical* level, reach and conversion to the participants on the *functional* level and economic opportunities on a *business* level. On top of these generic benefits for all participants, the four different roles in the model should benefit from specific effects as well.

Also, AS-PSPs are in a prime position to monetise the opportunity created by the DCSI's interoperability between the AS-PSPs and e-APs. They can create new business products and services based on their strengths in reach and KYC/AML expertise on a charge-per-request basis. This could be, amongst others, digital identity solutions provided to trusted third parties such as online merchants, or offering their reach to the e-APs in the services layer. In this way, the AS-PSPs have instant access to the innovative potential of the e-APs, which offers them the opportunity to adopt or adapt to the key innovations and add their own unique selling points like KYC and customer services.

2.3.1 Specific benefits for the AS-PSPs

The DCSI offers AS-PSPs the opportunity to reap the benefits of the combined reach and conversion effectiveness as they can offer their own e-AP products and services by opening up their capabilities to the market.

2.3.2 Specific benefits for the e-APs

The e-APs can increase the reach of their own service, opening-up new client-bases and markets by connecting to the DCSI and utilising its interoperability between the different schemes and/or platforms. Also, they can build on their high level of user convenience (conversion) and offer this to advise the AS-PSPs and other parties for certain fees. Because

most e-APs in the services layer are purely Internet-based, customer due diligence is a challenging operation. Via the DCSI, e-APs can use the AS-PSP's strength in KYC/AML as a means of reaching their own customer due diligence compliancy, for online contracting and customer authentication. Furthermore, the DCSI could help the e-AP as their customers could use the AS-PSPs customer care facilities, like transaction inquiries and refund requests.

2.3.3 Specific benefits for merchants

Merchants can increase their reach with the interoperability between the different e-AP and OBeP schemes potentially increasing their revenue. If the merchants would strive for the same level of pan-European reach, they would need to implement all individual e-AP and OBeP schemes (or outsource this operational work to Collecting PSPs). With the DCSI a merchant only has to connect to one e-AP or OBeP and then they are automatically connected to all registered providers. This simplified payments architecture decreases a merchant's operational costs and reduces complexities in the reconciliation process.

When coupled with real-time payments, the merchant can also improve it's working capital facilities, as payments are not only confirmed real-time but also credited on their account in real-time.

2.3.4 Specific Business-to-Business benefits

The direct communication between AS-PSPs, e-APs and businesses makes cumbersome and slow exchange of paper documents unnecessary. In this way, the DCSI can have a catalytic effect on the continuing development of paperless trade in the Business-to-Business market. Because confirmation of the payment is real-time delivery times can be reduced. A business can immediately fulfil its side of the agreement if the payment is completed. This can help reduce costs of businesses, because they can potentially reduce their inventory. On the side of the payee, the faster payment improves his liquidity, reducing the need to attract external working capital.

A business can perform real-time credit rating checks on a pan-European level if the potential business partner has given his consent. In this way, the business partner enrolment becomes faster and easier, as one party can have access to all account information of a business instantly instead of requesting account information at the different AS-PSPs and e-APs.

2.3.5 Specific benefits for consumers

In the end, most benefits of the DCSI can be linked to added customer value. The increased efficiency and new products and services of the European e-/m-commerce offers higher service levels and more possibilities for the consumers and merchants alike. Currently, consumers are restricted in pursuing online purchases in Europe, because they are not free to use the online payment scheme or platform of their choice. By opening up the online payments market and assuring interoperability between all the local payment schemes and niche payment platforms, the DCSI empowers the consumers to make any purchase they wish within the European economy, which of course also improves the merchant's business. Moreover, they are free to choose the AS-PSP or e-AP they desire and are no longer obligated to have multiple accounts to make pan-European payments, making the payment process as a whole more convenient and simpler.

3. THE PATH TO THE DCSI

The implementation model of the DCSI has not been given much thought and is still to be explored. This chapter gives some high level considerations for careful consideration, especially on the central versus decentralised models, which both have appealing characteristics. In both scenarios the trust in the network is organised centrally, they differ mainly in the operational and technical approach.

3.1 Centralised vs. decentralised network model

A centralised model offers a highly controllable network, with one clear central hub responsible for all the operational effort, information exchange, adherence and technical stability. A decentralised model on the other hand, offers more flexibility and cuts the dependency of the central hub as a single point of failure. **Table 1** offers a high level comparison of the two models in relation to the DCSI.

Criteria	Decentralised network model	Centralised network model
Scalability	All communication is directly between sender and receiver. Adding nodes to the network does not require changes.	All communication goes through a centralised access point. Adding nodes to the network may require changes if the central hub needs to expand its capacity.
Robustness	Because all nodes are equal failure of a node does not lead to a failure in the network. Impact is only felt locally.	Without proper redundancy measures failure of the central node can lead to failure of the network. Failure of other nodes has only local impact.
Management	Participants are reachable when compliant and are listed in the registry. Additions and subtractions from the network are potentially managed in real-time.	If the network grows, additional hubs may be required in order to keep the hub manageable.
Existing ecosystem	A decentralised network allows for including the existing online payment solutions, which are often also decentralised in nature.	Inclusion of the existing solutions may be more difficult due to the misalignment of operating models.
Legal	A central organisation has to bind all organisations. Trust is organised centrally.	The central party is responsible for the legal compliancy of all participants.
Technical	Errors in inputs and outputs have to be addressed by each node individually. Security breaches have local consequences; everybody is responsible for their own security.	Errors in inputs and outputs are addressed in the central node. Security breaches of the central node have consequences for the entire network.

Table 1: *Decentralised versus centralised models*

A general reflection is that both approaches require central, pan-European and multi-stakeholder governance. In one case this is realised through a central registry of meta-data of trusted parties and central contracting (similar to SEPA governance), in the central paradigm it is the central platform and central contracting.

3.2 Open market for DCSI services

The DCSI is an open initiative. This means that any party that can comply with the criteria of the DCSI and become part of the trust network can offer their innovative e-/m-commerce solutions to the consumers, merchants or even e-APs or AS-PSPs.

This should be equally true for the host of the DCSI-registry, the bearer of the centralised trust. Regardless of the operational model that is chosen for the DCSI (centralised or decentralised), this important trust aspect of the DCSI is a centralised function that needs to be filled by one or more parties capable of bearing that weight.

One aspect of this centralised trust is the participation registry, which lists the reachability of all participants. The second aspect of the centralised trust is centred around compliance. All participating parties must be able to operate in accordance with the rules and regulations of the DCSI. Such compliance could include data protection measures that need to be in place in order to protect the privacy of the involved customers, but also customer due diligence aspects like know-your-customer and anti-money laundering measures. The party that will guard this centralised trust could be either a single trusted entity or potentially even a network of such organisations.

In conclusion, the operational model of the DCSI, centralised or decentralised, is yet to be decided. But the centralised trust seems to be a fixed feature of this pan-European initiative for interoperability between AS-PSPs and e-APs as it fulfils a crucial role in reaping the potential benefits the DCSI could offer to the European economy. It is up to the European financial industry to find a solid solution to make this trust operational.

4. CREATING THE DCSI

4.1 Stakeholders

The DCSI is an initiative from and for the payments industry, in support of the entire European e-/m-commerce landscape. Therefore, the stakeholders involved in creating the DCSI should also be found amongst AS-PSPs, e-APs, merchants and consumers alike. These four cornerstones of the online commerce industry are all of equal importance for the further development of the DCSI. The AS-PSPs and e-APs should agree on what customer information is transferred and in what way, because they have the practical experience with such sensitive data transmission with regard to confidentiality, integrity and availability of the connection. Merchant organisations can offer valuable input on what type of services would be of interest for them to support and improve their business. Similarly, consumer organisations can provide their expertise with regard to customer experience, privacy concerns and usability criteria.

4.2 The process of co-creation

The development of the DCSI would benefit greatly from a collaborative approach from the entire payments industry. One might even argue that a co-creation approach is required for the DCSI to become a success, since a collaborative approach from AS-PSPs, e-APs, merchants and consumer organisations would ensure that the potential benefits for all parties involved would get equal priority.

If these parties could design both the business and technical side of the DCSI, then the chance of introducing the right, mutually beneficial services in the initial launch of the DCSI would be optimised. This would give adoption of the DCSI a strong impulse,

significantly strengthening or quickening the release of the potential benefits for the European economy.

The following implementation of the DCSI is mostly a decentralised effort from all the participating parties. They need to create the API-interfaces in their own infrastructure, as a landing point for the DCSI-related API-calls. The central registry and governance, needs to be created in parallel, by the party or parties that will act as the centralised trust bearer.

Finally, the APIs, which are the technical realisation of the DCSI, need to be launched with sufficient effort from the stakeholders, bringing attention of their potential to the innovative third-party providers. With development competitions and awards, the creative spark of e-/m-commerce innovators is lit immediately, releasing innovative new business models, based on the DCSI's capabilities and strengths early after its launch.

4.3 Next Steps

The next step in realising the DCSI is to find participants that are willing to cooperate in the co-creation of the DCSI. It is paramount to obtain as much support as possible from the AS-PSPs, e-AP providers, merchants and consumer organisations, because the success of the DCSI is dependent on their involvement. If an early critical mass of participants is reached, other parties are incentivised to also participate in the DCSI due to positive network externalities. If more AS-PSPs participate in the DCSI it will become more attractive for the e-APs to participate and vice versa. Furthermore, it is important that the entire European community embraces this initiative. If the participants of the DCSI represent as many of the European member states as possible, then the pan-European interoperability, a key feature of the DCSI, can be achieved and the benefits of the DCSI for the European economy can become a reality.

The financial industry can serve its customers better, by creating the Digital Customer Services Interface.

GLOSSARY

Access to the Account (XS2A)	Concept introduced in the preliminary versions of the second Payment Services Directive that mandates payment services providers that hold accounts for their end-users, to enable third parties to initiate payments from these accounts. This concept would reduce the exclusivity in the relationship between the end-user and the payment service provider that holds his account.
AIS	Account Information Service. The AIS allows an AISP to request only the information from designated payment accounts receiving the associated payment transactions history.
AISP	Account Information Service Provider. New regulatory role in the TTP domain that is allowed to make an AIS.
Electronic and Alternative Payments (e-AP)	Innovative non-card payments that have been developed in the last decade. More specifically payments where no Primary Account Number (PAN) is used in the process. e-APs are the alternative to traditional cash, cards and ACH payments and are mostly developed by non-bank providers. Examples are PayPal, iDEAL, Yandex money, Paym, Skrill and Sofort.
Automated Clearing House (ACH)	An electronic network for financial transactions
Authentication	Process of verifying identity of an individual, device, or process. Authentication typically occurs through the use of one or more authentication factors such as: ▸ Something you know, such as a password or passphrase ▸ Something you have, such as a token device or smart card ▸ Something you are, such as a biometric features
Authorisation	In the context of access control, authorisation is the granting of access or other rights to a user, program, or process. Authorisation defines what an individual or program can do after successful authentication.
Anti Money Laundering (AML) requirements	Legal controls that require financial institutions and other regulated entities to prevent, detect, and report money-laundering activities
AS-PSP	Account Servicing Payment Service Provider. A payment service provider that offers its services based on (bank) accounts that are part of the SEPA and Cards infrastructure.
Card payment	Payment initiated with a card (or a CNP alternative) and processed through one of the card networks (either international or domestic)
Clearing and Settlement Mechanism (CSM)	A set of systems, rules and procedures whereby financial institutions present and exchange data and/or documents relating to transfers of funds or securities to other financial institutions at a single location (e.g. a clearing house). These procedures often include a mechanism for calculating participants' mutual positions, potentially on a net basis, with a view to facilitating the settlement of their obligations in a settlement system.
Channel	Medium through which parties interact. In this opinion paper the channel is part of the context and refers to the device on which information is being shared.

Charge-back	Revoking a payment initiated by the payer. When the merchant initiates the payment, it is typically referred to as a 'refund'.
Collaborative domain	The collaborative domain is the area where players cooperate in order to lay the foundation for competitive services.
Collection Payment Service Provider (C-PSP)	A C-PSP offers (web) shops online services for accepting electronic payments by a variety of payment methods including credit card, bank-based payments such as direct debit, bank transfer, and real-time bank transfer based on online banking.
Competitive domain	Part of the services where commercial parties compete in the market
Context	Set of parameters that determines the transaction. In this Opinion Paper, context refers to parameters like relation, channel, product, etc.
Credit Card	A type of payment card, indicating that the holder has been granted a line of credit. It enables the holder to make purchases or withdraw cash up to a prearranged ceiling.
Credit Transfer	A payment order or possibly a sequence of payment orders made for the purpose of placing funds at the disposal of the beneficiary.
Direct Debit	A payment instrument for the debiting of a payer's payment account whereby a payment transaction is initiated by the payee on the basis of authorisation given by the payer.
DCSI	Digital Customer Services Interface
e-APWG	Electronic Alternative Payment Working Group of the Euro Banking Association (EBA)
E-Commerce	Trading in products or services conducted via computer networks such as the Internet
E-Identity	Identity services in an online context, typically oriented toward increasing the assurances of interacting parties (e.g. consumers and merchant, governments and citizens)
E-Money	Electronic money is a digital equivalent of cash, stored on an electronic device or remotely on a server.
E-Mandate	Electronic mandate. Usually referred to in combination with (SEPA) direct debits.
End-User	For the purpose of this paper, the term end-user refers to both the retailer and consumer.
E-Payments	Payment instructions that enter a payments system via the Internet or other telecommunications network. The device used to initiate the payment could be a computer, mobile phone, POS device or any other device. The payment instruments used could be an e-money product, payment card product, credit/debit transfer or one of the innovative payment products.
E-Service	Service that is executed online, facilitating the interaction between e.g. consumers and merchants or governments and citizens.

Four party model	Concept for service provision in two-sided markets where both sides of the market are serviced by a dedicated service provider, which cooperate with each other on the basis of the scheme rules for the so called 'competitive domain'.
Inclusive	Being open for parties to participate on the basis of transparent access criteria.
Infrastructure	The infrastructure of payment systems refers to the complete set of (1) *payment instruments*, (2) *processing*, and (3) *settlement.*
Internet payment	A type of e-payment. Payment instructions which enter the payment system via the Internet. The device used to initiate the payment could be a computer, mobile phone or any other device. The payment instrument used could be an e-money product, payment card product or direct transfer, among others.
Interoperability	A situation in which payment instruments belonging to a given scheme may be used in platforms developed by other schemes, including in different countries. Interoperability requires technical compatibility between systems, but can only take effect where commercial agreements have been concluded between the schemes concerned.
Know-Your Customer (KYC)	Know-Your-Customer (KYC) is the process used by a business to verify the identity of their clients. Effectively, this means that banks cannot service customers whose identity cannot be verified. The term is also used to refer to the bank regulation, which governs these activities.
M-Commerce	Mobile e-commerce (m-commerce) is a term that describes online sales transactions for which wireless electronic devices such as hand-held computers, mobile phones or laptops are used.
OBeP	Online Banking electronic Payment. This term refers to the category of e-payments products where online banking is used for authenticating the consumers when conducting a payment.
Payment infrastructure	Following the definition of the ECB (2010) the payment infrastructure consists of processing layer, settlement layer and an instruments layer.
Payment instruments	A tool or set of procedures enabling the transfer of funds from a payer to a payee. The payer and payee can be one and the same person.
PIS	Payment Initiation Service. A PIS allows a PISP to request if a consumer has enough funds on his or her account (e.g. to meet a certain payment requirement).
PISP	PIS provider. New regulatory role in the TTP domain that is allowed to make a PIS.
Point of Sale (POS)	Point of Sale (also called POS or checkout, during computerisation later becoming electronic point of sale or EPOS) is the place where a retail transaction is completed. It is the point at which a customer makes a payment to the merchant in exchange for goods or services.
Processing	The performance of all of the actions required in accordance with the rules of a system for the handling of a transfer order from the point of acceptance by the system to the point of discharge from the system. Processing may include clearing, sorting, netting, matching and/or settlement.
PSD	Payment Services Directive

Real-time payment	The mechanism through which the account of the recipient is credited within minimal time after initiation of the payment.
Reconciliation	Bringing together payment and delivery information in the accounts
Retail payment	A payment that meets at least one of the following characteristics; (1) the payment is not directly related to financial market transaction; (2) the settlement is not time-critical, (3) the payer, payee or both are individuals or non-financial organisations and (4) either the payer or the payee or both are not direct participants in the payments system that is processing the payment.
Scheme	Set of rules that govern the collaborative space of a certain market
SEPA	Single European Payments Area
SEPA Credit Transfer (SCT)	A payment instrument for payments between current accounts held at banks, allowing a payer to instruct the institution with which its account is held to transfer funds to a beneficiary Single Euro Payments Area (SEPA) – also see Credit Transfer.
SEPA Direct Debit (SDD)	Direct Debit in the Single Euro Payments Area (SEPA) – also see Direct Debit
Settlement	The completion of a transaction or of processing with the aim of discharging participants' obligations through the transfer of funds and/or securities. A settlement may be final or provisional.
TPP	Third Party Provider. Definition according to the ECB: "Service providers offering internet-based account information services and/ or payment initiation services for payment accounts for which they are not the account servicing PSP are qualified as third-party service providers (TPs). The report focuses on the legal entity offering the account information services and/or payment initiation services which enters into an agreement with the account owner. Outsourcing agreements are considered to be under the outsourcer's responsibility and are therefore not covered in this report. Both licensed PSPs and non-licensed service providers can offer services as a Third Party Provider".

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