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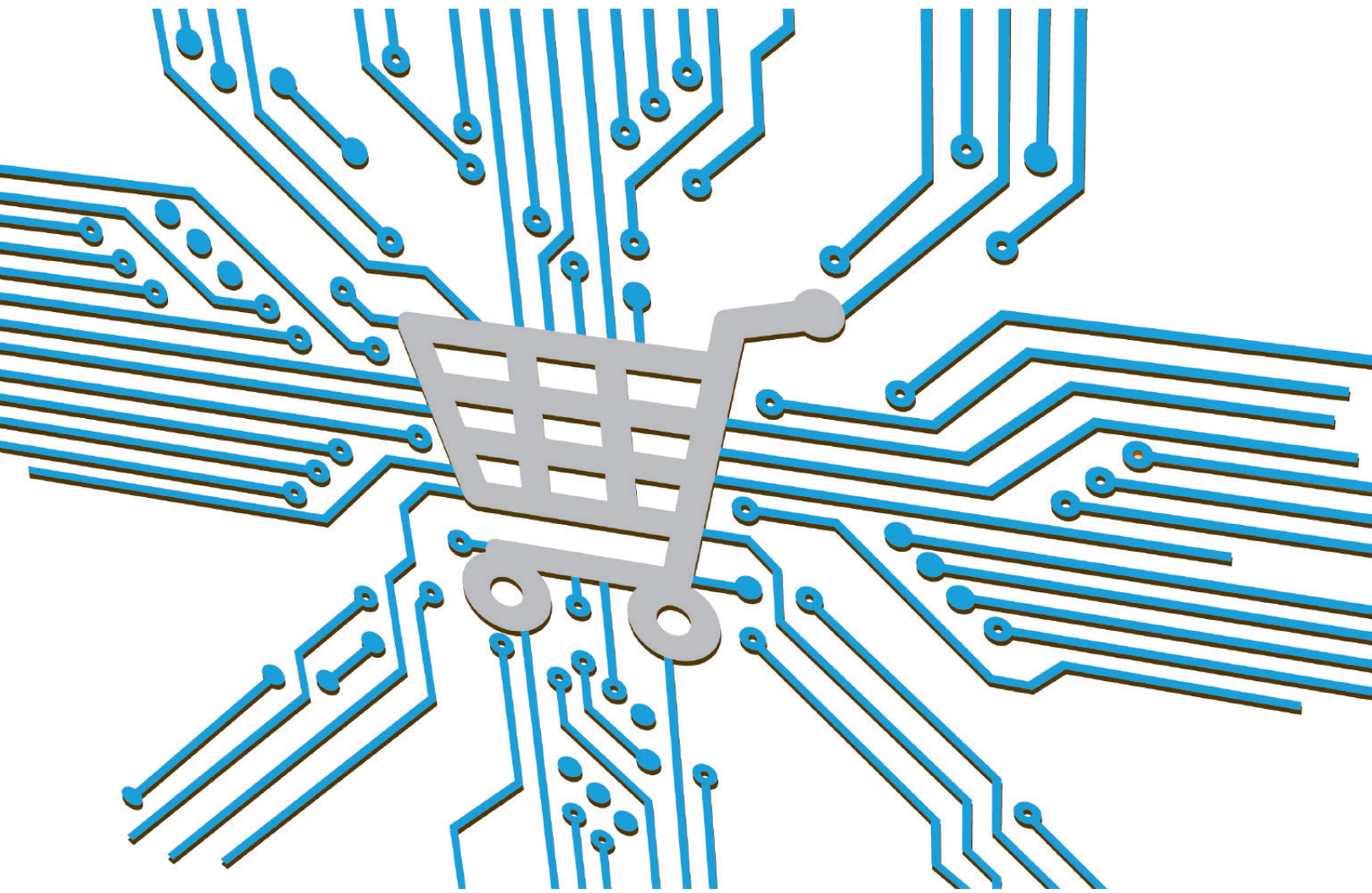

Opinion Paper on Next Generation Alternative Retail Payments: **Infrastructure Requirements**

EBA Working Group on Electronic Alternative Payments

Version 1.0

15th December 2014

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Some of the concepts, assumptions or conclusions included in the present paper have been introduced in the "Opinion Paper on Next Generation Alternative Retail Payments: User Requirements" and may be described or explained there in more detail.

EXECUTIVE SUMMARY

The advance of e-/m-commerce has sparked a large number of new and innovative payment initiation methods that cater for all kinds of contexts, which are commonly called electronic Alternative Payments (e-APs). As outlined in the e-APWG "Opinion Paper on Next Generation Alternative Retail Payments: User Requirements", e-APs derive their success from addressing the convenience and functionality ('conversion') gaps that are left open by traditional payment propositions. This is because e-APs are mainly focusing on the messaging part of payments, which has become increasingly decoupled from the interbank payment infrastructure. This messaging domain is called the 'services layer'. e-APs can therefore be defined as 'services' built on top of existing interbank payment infrastructures such as the SEPA infrastructures (see **figure 1**).

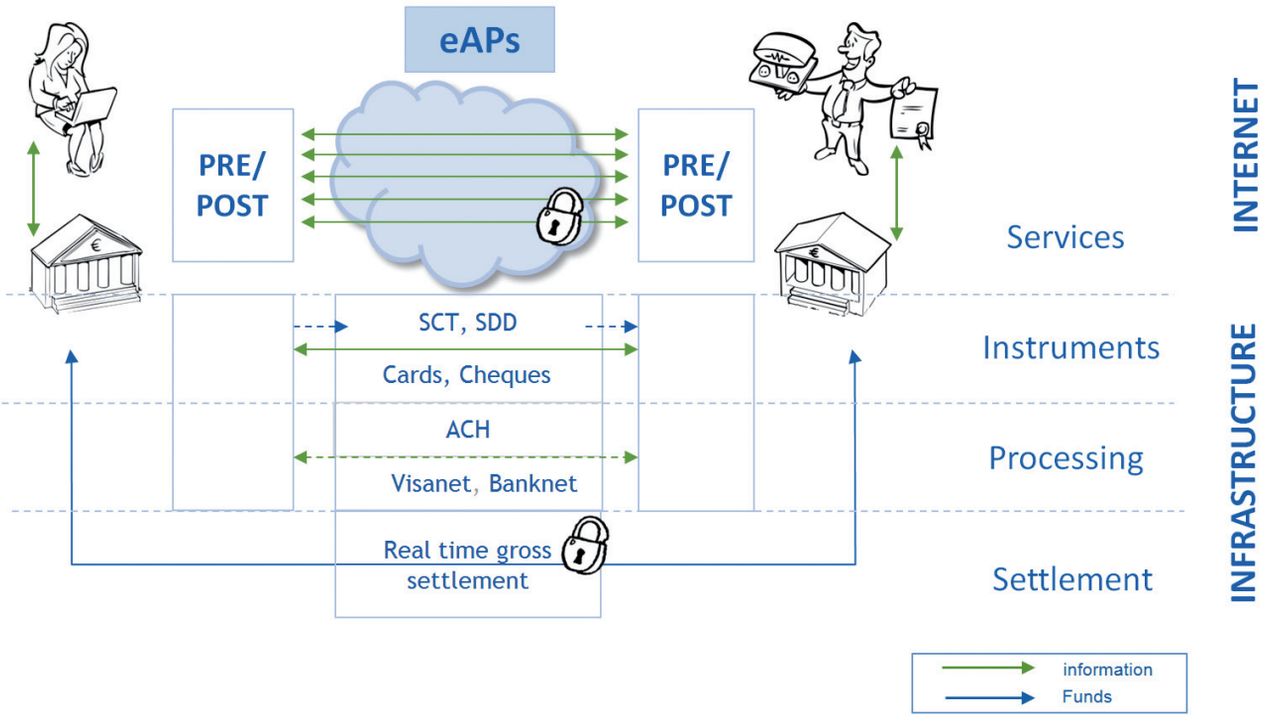


Figure 1: *e-AP service 'on top of' of the SEPA infrastructure*

With payers and payees seeking to fulfil their requirements in terms of 'reach', 'conversion' and 'cost', we see that the harmonised SEPA infrastructure yields 'reach', but not the required functionality ('conversion'). The e-AP offerings score high on 'conversion', but not on 'reach'. As a result, this lack of 'reach' of e-APs leads to a fragmented payments landscape and requires payers and payees to each onboard e-AP services (including KYC), which is holding back the adoption of e-APs.

Therefore, creating 'reach' in the domain of e-APs is a logical trend, which can be realised through standardisation, interoperability and mass adoption. Today, we see three market forces seeking to achieve this:

1. *Expand functionality*: upgrade today's SEPA interbank infrastructure with additional functionality to better meet end-user's requirements and enable more sophisticated e-APs to be built on top of them, offering 'reach' through end-to-end trust and standardisation. The current industry interest towards 'real-time payments' can be seen as a first manifestation of this market force.

2. *Harmonise services layer*: create end-to-end trust in the services layer: standardise the interfacing towards the existing trusted SEPA interbank infrastructure. In addition, the de facto growth of the services layer (through e-APs) allows more transactions to be handled in this layer. Not every transaction will lead to a transaction in the infrastructure. The services layer becomes part of 'the infrastructure'.

3. *Paradigm change*: disrupt the services and infrastructure layer altogether by means of new technological concepts such as 'distributed consensus technologies' (i.e. block chain).

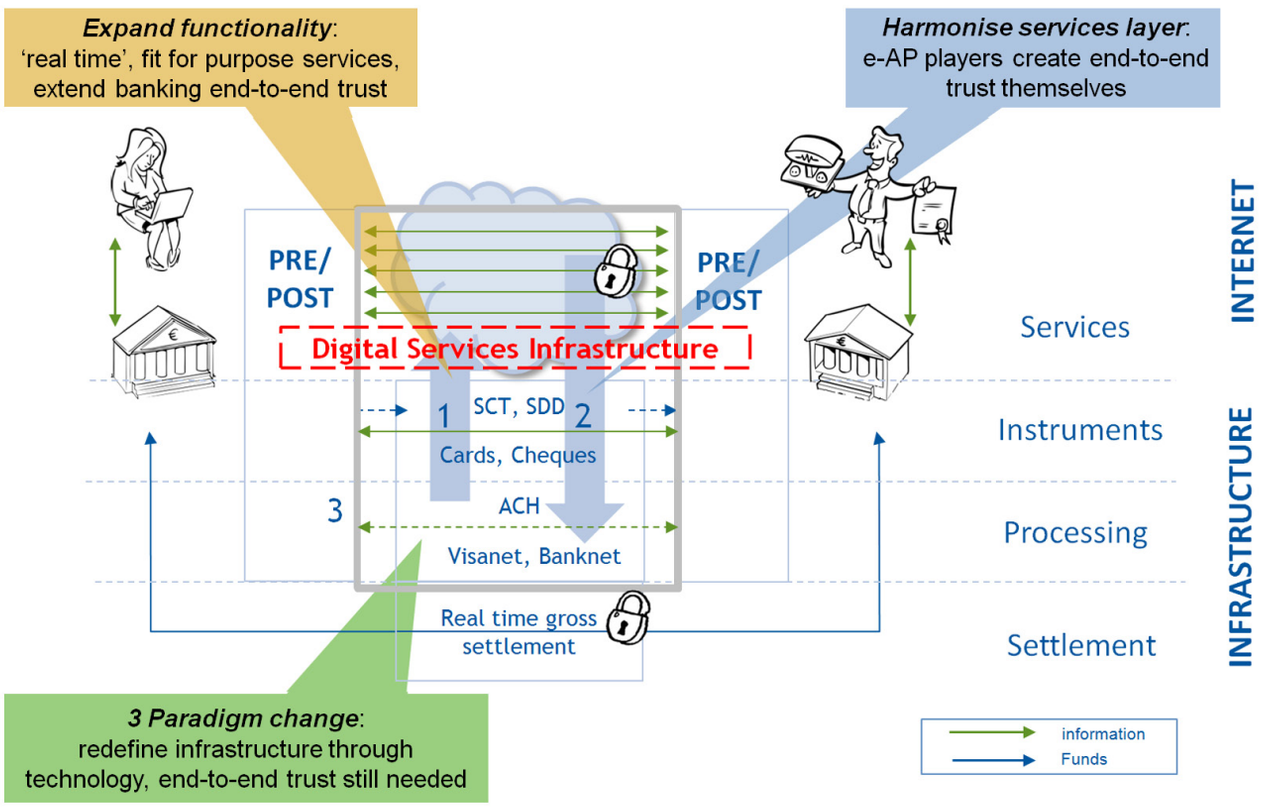


Figure 2: *Three market forces driving the Digital Services Infrastructure*

These three forces are likely to play out in a mix. In any scenario 'reach' will have to be created through a new layer, which is defined in this paper as the '*digital services infrastructure*' (DSI – see red box in **figure 2**). This layer must be seen as a logical evolution from both the interbank infrastructure and the services layer: it is where both worlds meet.

In detail, DSI is (mostly) a virtual infrastructure, which provides trusted access (through API – application programming interface – technology) to today's and future SEPA infrastructure enabling e-AP services with 'reach'. In other words, today's collaborative infrastructure layer is extended with the DSI to better cater for (bank and non-bank) e-AP services in the competitive domain. As an example, the DSI will enable pan-European immediate payments via mobile devices, a crucial building block of today's drive towards a real time payments infrastructure.

As 'end-to-end trust' is a key ingredient of 'reach', digital identity will play a pivotal role in this 'Digital Services Infrastructure'. For the banking industry, there lies a concrete opportunity and challenge in developing the 'Digital Services Infrastructure', leveraging the banking capability built up through security needs and KYC regulatory obligations. Because digital identity is a core ingredient, this infrastructure can have a much wider application in the e-/m-commerce than pure payments: i.e. authentication, signing and attribute services are an emerging market in which the banking industry could play a leading role.

Several European regulations (PSD2 – Access to the Account, Secure Pay, AML4, eIDAS, Data protection) also point into the direction of an API-based Digital Services Infrastructure and the growing importance of digital identity.

The creation of the Digital Services Infrastructure would accelerate the innovation in the payments

domain and expand the market for both bank and non-bank players in the e-AP domain. Individual players will have to determine their strategy, for which the EBA Working Group recommends the following 'no-regret' steps (non-exhaustive list):

1. **Understanding the implications of the growing e-AP services layer:**
   The developments in the services layer have far reaching implications and the industry at large will benefit from a joint learning experience. This document is a first step in this direction.

2. **Experimenting:**
   The success of the services layer is partly explained by the amount of experimenting going on there. Payment practitioners are encouraged to investigate new paradigms outside their comfort zone, such as digital identity services and API's.

3. **Planning for change:**
   Against the background of continuous and accelerating change, industry stakeholders (varying from customers to regulators) expect change to happen. Successful change goes beyond the internal payment silos involving all disciplines, as customer centricity and relevance of the supply side solution will be the ultimate success factors.

The present opinion paper looks at the potential impact of the growing e-AP domain on payment infrastructure requirements from a payment practitioner's perspective. This work by the EBA's e-AP Working Group should be seen as one element that the EBA wishes to contribute to a possible response from the supply side to the challenge of delivering infrastructure solutions supporting instant payment services.

INTRODUCTION

Objective of the 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 developing electronic Alternative Payment (e-AP) instruments that are challenging the banks' and card issuers' prominent position in retail payment services. The EBA initiated a coordinated effort to gain a better understanding of the landscape of e-APs, understand drivers for this service domain and identify opportunities for the EBA membership to add value.

One of the working group's key deliverables so far was a summary of user requirements. As a next step this paper aims to facilitate a discussion on the impact of these requirements on retail infrastructures. It focuses on the relation between the interbank infrastructure enabling e-APs and the services that e-APs consist of. After defining and scoping the current role of infrastructures, this paper sets out three possible directions for future developments and suggests an approach for the EBA membership.

Reading guide

The first section will take stock of earlier work and rephrase and summarise the requirements for the entire payments ecosystem as the balanced combination of *reach, conversion* (functionality) and *cost*.

In section 2, the current landscape is described in terms of instruments, processing and settlement that are broadly accepted by today's payment practitioners. Technological developments, regulatory requirements and trends from other industries have shaped the payments ecosystem into the layered structure that we see today. This chapter will explore the significance of this structure for functionality and innovative power. Furthermore, section 2 will introduce a conceptual model to connect the diversity of end-users with that of payment infrastructures. As end-users are not directly connected with the payment infrastructure, the pre- and post-payment domains are introduced and requirements stem from the interaction of the infrastructure with these domains.

In section 3, the implications of the Internet as a channel for transactions will be added to the equation. The Internet has enabled fast and rich communication between payer and payee, in parallel to the process of the payment.

Section 4 moves back to the perspective of the infrastructure and looks at the interbank arrangements that it consists of. SEPA has introduced harmonisation in the infrastructure layer, from the instruments down to the settlement methods. What SEPA has not harmonised is the layer of Internet-based services on top of these instruments, resulting in fragmentation of initiation methods.

In section 5, we explore three possible scenarios for how the industry may move forward, each with their own dynamics and addressing the end-user requirements as described in section 1.

1. REACH, CONVERSION AND COST ARE THE OVERARCHING END-USER REQUIREMENTS

In this paper, we analyse the changing end-user demands for interbank payment infrastructures. The definition of the exact meaning of infrastructure will be an important part of section 2. This first chapter will take a closer look at the demands.

End-users are defined as payers and payees. Because end-users will ultimately determine the worth of the entire value chain, the starting point of this paper will be the work done by the electronic Alternative Payment Working Group (e-APWG) in the first half of 2014. The e-APWG collected user requirements and reported them in the "Opinion Paper on Next Generation Alternative Retail Payments: User Requirements". As e-APs are most visible in retail contexts, the examples in this paper will primarily concern retail clients (e.g. consumers and merchants). This does not mean that the conceptual framework presented is not also applicable to other user segments such as business-to-business payments.

The end-user requirements from the work of the e-APWG are used and restructured along three themes (*reach, conversion* and *cost*) as set out by Ecommerce Europe.

	Reach	Conversion	Cost
Ease of use – Simple / Simpler Solutions:		✓	
Mobility / Multichannel:		✓	
Free - Low Cost:			✓
Safe and Secure:		✓	✓
Unbanked and Anonymity:	✓		
Real-time Immediacy:		✓	
Flexibility and Choice:	✓	✓	
Preferences Specialisation:	✓	✓	
Returns / Refunds:	✓	✓	

Figure 3: *End-user requirements as defined by the EBA combined with the classification by Ecommerce Europe (2013)*

In **figure 3**, nine requirements are grouped along the three buyers' and merchants' themes that are also applicable for the wider range of payers and payees. This higher level of granularity is fitting the purpose of this opinion paper. How the nine requirements are assigned to one of the three themes is described in Annex A in more detail.

Reach, conversion and cost as categories of end-user requirements

Ecommerce Europe regularly issues position papers and other publications in which they put forward the needs of the e-commerce sector. For this purpose, they formulate these needs regarding payments conveniently and concisely in three categories: reach, conversion and cost. We present these categories here because they also apply to other parts of the market and are arguably just as important for consumers as they are for merchants. Reach is the extent to which visitors are potential payers. In terms of the payment system, reach is determined by the number of people that can be reached with the end-to-end trust, processes and infrastructure that is offered by the common network of banks. The main interest of end-customers in any network service (post, e-mail, telecommunications, etc.) is whether they can reach their counterparty. The relevance of any payment service depends fully on whether payer and payee can actually interact. In e-commerce contexts, reach can be defined as the number of visitors (of a webshop) that are potential buyers.

Conversion can be understood as the percentage of actors that can use the service, that actually do so. In e-commerce, this can be rephrased as how many potential buyers are 'converted' into actual buyers. Ease of use is a key driver of conversion. This category also comprises the functionality that comes with certain payment methods. Payment methods cater for different contexts, all having their own specific requirements (Innopay, 2007). After reach is taken care of, the functionality (fit-for-purpose) of the payment service should be the first priority.

The cost of a payment method determines the degree to which a trade turns out to be profitable for both sides. The cost of payments is always of interest for payers and payee and involves fees, but in some cases also cost of fraud (or measures to counter fraud). It should be understood that for both parties, the total cost of the trade is more than only that of the payment. The fact that a trade can be made in the first place (reach) and the fit of a certain payment service for a specific context (conversion) are factors that precede the issue of pricing.

Many examples can be found where the payment service of choice is not the cheapest but the one that balances best reach, conversion and cost.

The first chapter captured the requirements of end-users. They can be categorised as reach, conversion (functionality) and cost. How these end-user requirements are met is the focus of the second chapter, where a framework is introduced to assess payment services.

2. END-USER REQUIREMENTS REALISED THROUGH PRE- AND POST-PAYMENT SERVICES

Now that we have established reach, conversion and cost as the main user requirements regarding payment infrastructures, the question is raised to what extent the current interbank infrastructure meets these requirements. In order to provide an answer, it is important to first understand what the current infrastructure looks like. Therefore, this chapter will introduce a conceptual model on which the rest of the paper will build.

2.1 Three domains of the payment

It can be observed that for online transactions end-users increasingly choose 'alternative payment instruments'. Looking at most overlay services, there often is a 'traditional' payment instrument involved in the transaction, but this is not always visible for the end-user. The user experience does not lie with the actual payment itself, but with the (information) processes surrounding the payment. End-users do not interact with infrastructures themselves. Rather, they interact with their own payment service provider through different channels. This interaction entails the arrangements to initiate a payment and to be informed about the result. In between lies the actual payment and the underlying infrastructure. This can be structured as follows (**figure 4**):

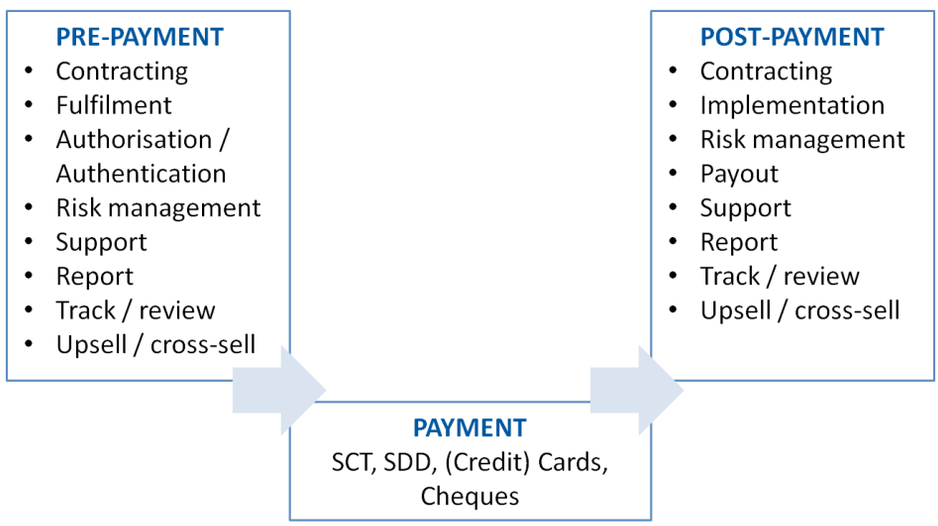


Figure 4: *Three parts of the payment process*

The payment is composed of three domains: the pre-payment (all information processes preceding the actual payment), the actual payment through the banking clearing and settlement mechanisms (SCT, SDD, card, cheques) and the subsequent post-payment (all information processes succeeding the payment). These three domains are tightly interlinked. Based on the outcome of the pre-payment process (authentication and balance checks), the actual payment is processed in the interbank infrastructure, resulting in actual funds transfer. Subsequently, the result of the payment process is handled in the post-payment domain (reconciliation, charge-back and other exception handling). The actual user experience (i.e. payment service) is fully defined by these pre- and post-payment information processes.

2.2 Infrastructure: a layered and well balanced eco-system

As the Internet matured, the channels for pre- and post-payment services have grown more advanced and the services more complex. E- and m-commerce created retail contexts in which payer and payee

are separated in time and place, which demanded additional functionality. This functionality is created through e-APs in the pre- and post-payment domain (information services), while the actual payment resulting in funds transfer remains unaffected. What we see is that services were built on top of the interbank, infrastructure for SCT, SDD, cards and cheques. Eventually, this led to a stacked ecosystem that is illustrated in **figure 5**.

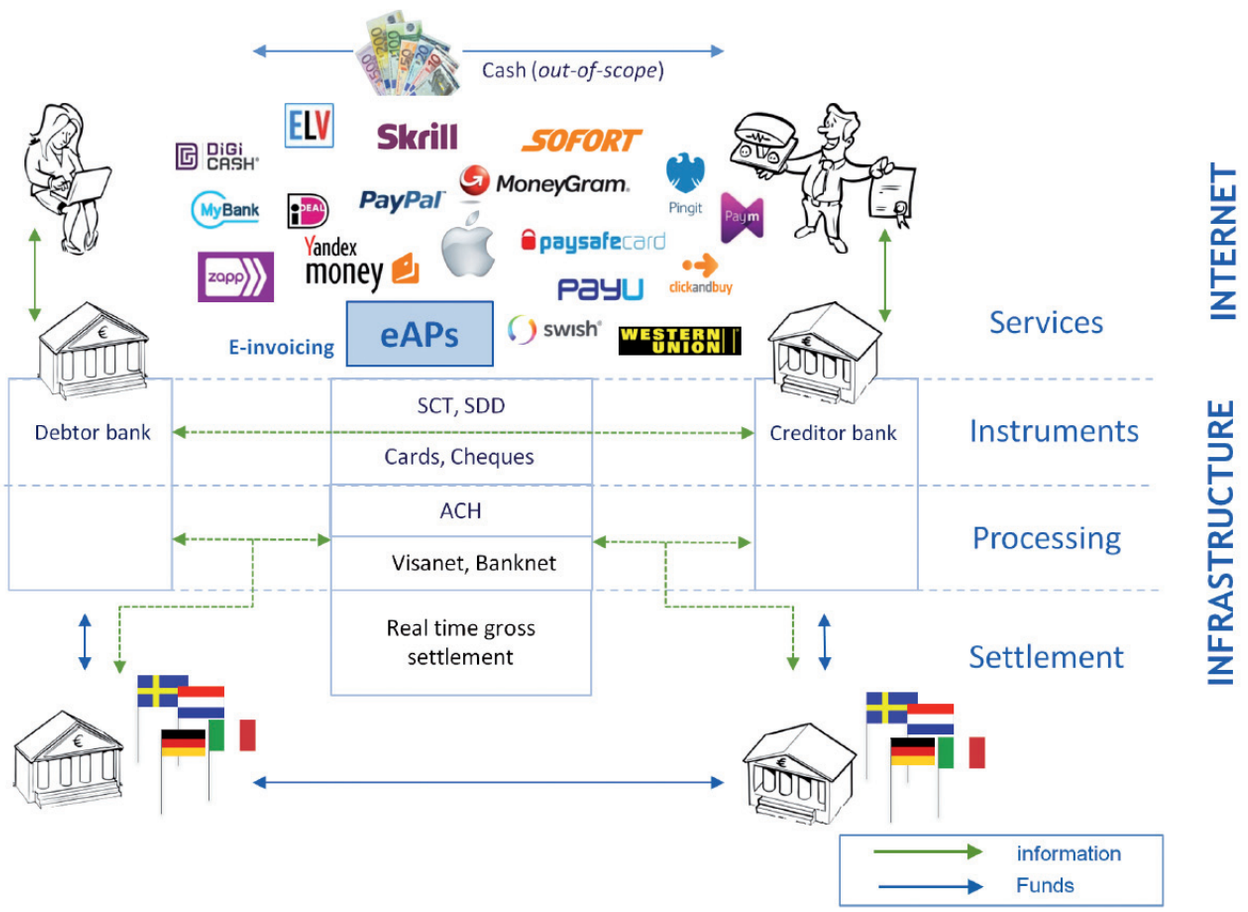


Figure 5: *A stacked ecosystem evolved on top of the "traditional" infrastructure for SCT, SDD, cards and cheques*

Figure 5 forms the basis for further analysis in this paper. To ensure a full understanding, the following paragraphs will explain the layers of the ecosystem. Broadly speaking, the payment system can be categorised into four layers. The three bottom layers represent the traditional payment system and are composed of a layer of payment *instruments*, *processing* and *settlement* (ECB, 2010[1]). Together, these three layers will be referred to as 'payment infrastructure' in this paper. On top of this traditional infrastructure, a fourth layer has evolved, very much based on Internet technology. This paper will refer to the fourth layer as the *services* layer. It should be noted that 'infrastructure' in payments is not purely technical. Equally as important are the functional, legal and operational constructs connecting all participants to the infrastructure.

Instruments

Payment instruments refer to the interbank tools that enable a payment. The most common distinction is between cash and non-cash instruments. The usual non-cash payment instruments are credit transfers, direct debits, payment cards and cheques. The SEPA instruments are defined by their respective rulebooks.

[1] Kokkola, T. e.a. (2010). The Payment System: European Central Bank

Processing

When debtor and creditor hold accounts with different institutions, the processing layer takes care of interbank communication, aiming to frequently (usually several times per day) offset bilateral financial balances between institutions (via ACH), resulting in regular settlement payments via central banks (see below). For processing we see separate local, European (SCT/SDD) and mainly global infrastructures for cards.

Both on the debtor and the creditor side, communication with these parties occurs in the form of technical message flows (blue arrows in **figure 4**), where trust and resilience are created and managed through strong governance within a regulatory framework set out by the ECB.

Settlement

In reference to payments, settlement is the process in which obligations between two or more parties are discharged. The layer consists of the payment systems, operated by either the central banks or the private sector, together with a real-time settlement system to even balances on a periodic basis. As an alternative to the system of central banks, individual banks can maintain correspondent banking relationships to settle balances. Within the euro area, the systems used for this purpose are EURO1 and TARGET2.

For the purpose of this paper, these three layers will be collectively referred to as 'payments infrastructure'.

Services

Banks and other Payment Service Providers traditionally built their propositions for end-customers on top of the three layers mentioned above. In this way, a layered ecosystem emerged. Initially, these pre- and post-payment services were limited to the interaction between end-customers and their respective PSP. As mentioned, this fourth (services) layer has evolved considerably with the maturing of the Internet and the proliferation of e-APs as pre- and post-payment services have become interactive and secure messaging occurs outside of the payment infrastructure. How the e-commerce payment ecosystem evolved into this complex stack of e-services and players is described in more detail in Annex B.

Infrastructure according to the ECB

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.

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.

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.

Source: ECB (2010)

In summary, starting from the situation where offline payment methods were used in online contexts for the lack of alternatives, the financial industry has come a long way facilitating the strong growth of e-commerce. We see that with the rise and maturing of the Internet a whole new layer of innovative payment services is created, referred to as e-APs. In this new layer non-banks play an important role, for which in Europe a new regulated category was created (payment institutions). In the next section, we will examine what additional requirements these developments pose for banks and what implications this has for the traditional payment infrastructure.

3. INTERNET DECOUPLED THE 'PRE' AND 'POST' DOMAIN FROM THE PAYMENT

As mentioned, the payment process can be divided into three domains, the pre-payment domain, the actual payment (through the regular infrastructure) and the post-payment domain. In the traditional payment system, before the new services layer was developed, banks used to offer 'pre-' and 'post-'services independently and the only transaction took place through the payment infrastructure. Pre- and post-payment information 'travelled' with the payment through the infrastructure: communication around the payment from payer to payee was handled by their respective Payment Service Provider. This concept is illustrated in **figure 6**, a simplified version of **figure 5**.

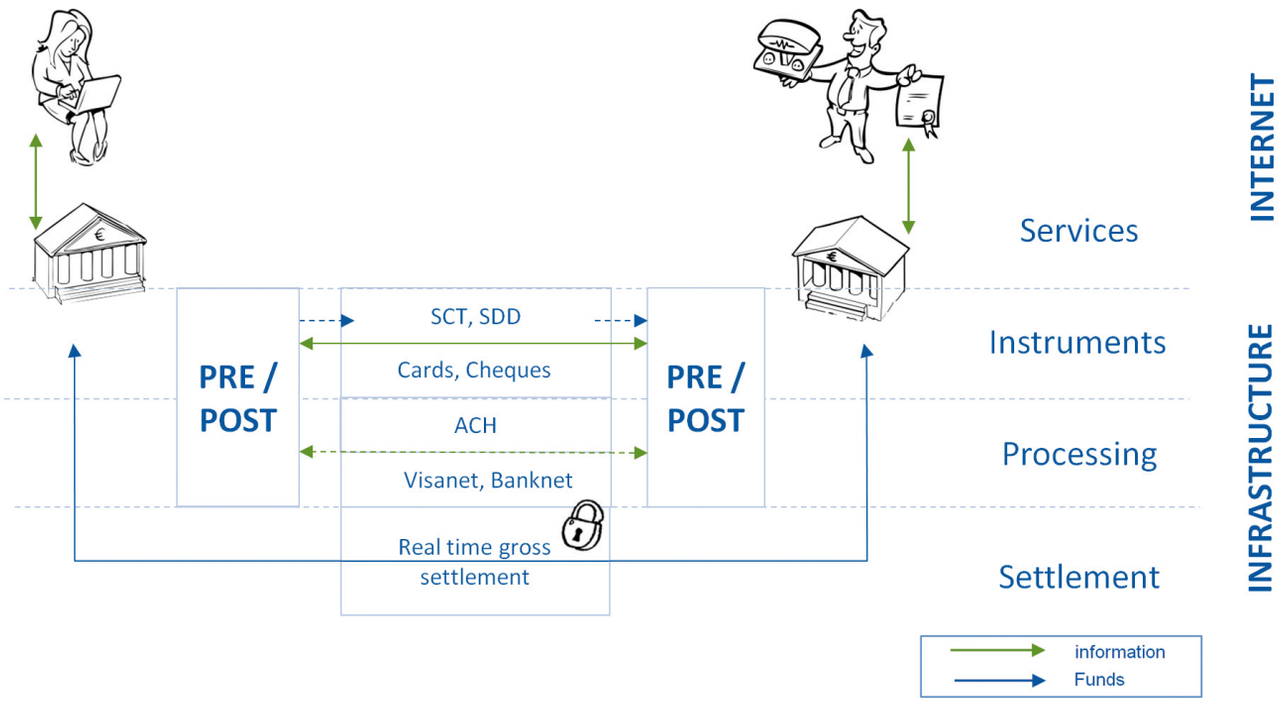


Figure 6: *Traditionally, all payment information travelled with the funds through the payment infrastructure*

The rise of the services layer was a consequence of the broadening of end-customer demands and the emergence of new online (retail) contexts that demanded more sophisticated and real-time messaging between payer and payee. As a result, the exclusive position of traditional PSPs in secure payment messaging between payer and payee came under pressure. In **figure 7**, the array of messaging alternatives (i.e. various e-AP services) between payer and payee is illustrated (represented by the upper set of green arrows). This separate layer of messaging for payment information outside the payment infrastructure creates new possibilities. When payer and payee can securely exchange information about the payment, all kinds of new functional possibilities for meeting end-user requirements can be created. The shape or structure of information exchanged between payer and payee is not limited to the requirements of a SCT or a card transaction as we see in the wide array of today's e-AP services. Examples can be found particularly in online services, but are not limited to online contexts:

- PayPal is an example of messaging between payer and payee. Eventually, a funds transfer is initiated (most often through the card or SDD infrastructure).

- Online Banking e-Payments (OBeP) services can also be attributed to the services layer. OBeP services enable messages exchange between payer and payee. The OBeP informs the payee that the payment has been initiated, often in the form of a payment guarantee. With this information, payer and payee can proceed their trade, even while the money only arrives one day later.

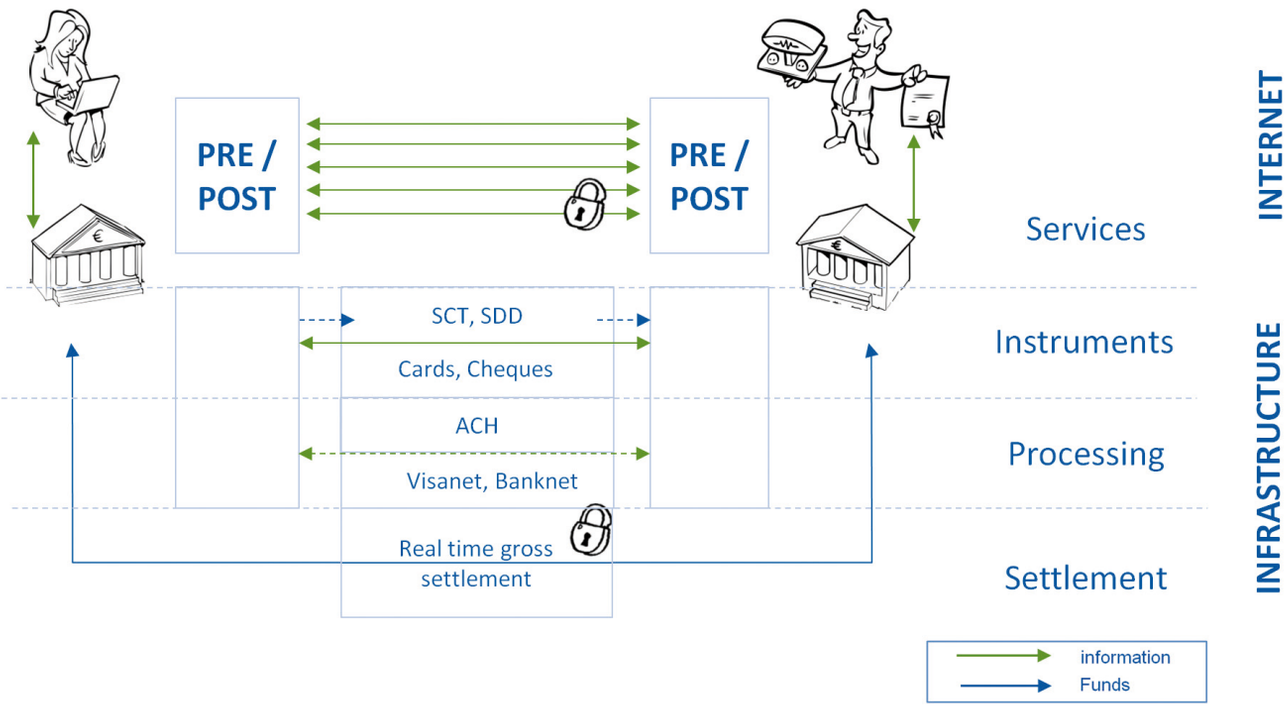


Figure 7: *Parallel messaging has filled the gap between end-user requirements and the capabilities of the payments infrastructure*

The user experience for both payer and payee is determined to a large extent by the e-APs in the services layer. End-users, in their daily use of payment services, make no distinction between the exchange of information and a funds transfer through the underlying infrastructure. This puts new security, trust, convenience and compliance demands on providers of e-APs, and service providers in the infrastructure layer. Prior to the 'decoupling', the security and trust of transactions was handled solely through banks and bank-owned infrastructures.

Here lies the emerging opportunity of digital identity services, which could facilitate scalable trust in the (e-AP) services layer of the Internet. This thought will be elaborated later in the document. The demand for such easy-to-use identity solutions is comparable to what we see in the cards space. In physical retail the chip & pin security is built into the infrastructure, whereas in the online domain the 3D Secure service is an add-on, with limited uptake due to usability and low relevance for payers who tend to forget their credentials, therefore resulting in limited 'reach' and 'conversion', when formulated in terms of end-user requirements. Online credit card security would strongly benefit from an existing digital identity infrastructure. From 2015 onwards, the SecuRePay recommendations will take a step in this direction, as all internet payments will require strong authentication of the customer. This will force providers of payment services to rethink and/or offer authentication services.

To enable this part of the payment service, establishing the identity of the counterparty is a crucial part. When one can be sure of the identity of the counterparty, this limits the risk and the exchange of funds is reduced to a rather administrative challenge.

One conclusion is that payment related information no longer exclusively 'travels' with the funds, but that all kinds of payment-related information is being exchanged in parallel between payer and payee: e-APs enable the decoupling (also with regard to time) of payment and messaging.

Consumers interact less with their bank and increasingly with the e-AP service provider in the online services layer. New solutions will go beyond traditional direct debit and credit card connectivity and make use of today's internet techniques of APIs. The mobile revolution is accelerating this trend and upcoming regulation (PSD2, 'Access to the payment account') is also pointing in this direction.

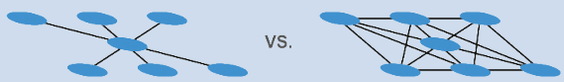
As the services layer grows in importance, it is to be expected that a larger part of the total fee (added value) can be claimed by the service providers in this layer, be it banks or non-banks. The services layer has also demonstrated that it is becoming less dependent on one specific infrastructure function.

A second conclusion is that, although end-users interact through the services layer, the underlying instrument determines to a large extent the regulatory framework that governs payment services. End-users should be aware that, for services that build on a card transaction, the card rules apply, while services that build on direct debits will have to be compliant with the rules that govern direct debits. e-AP service providers should inform end-users adequately about this. For regulators, the emergence of a services layer implies that they take a holistic approach and that policy goals regarding consumer protection, level playing field, etc. are addressed throughout the chain.

Technology is driving the development of the services layer

The services layer as it is defined in these sections depends on secure messaging via the Internet.

Over the last couple of years, the technology behind the Internet has progressed enormously and made easy and secure data connections available for almost everyone. This has put the exclusive position of many network industries under pressure.



Because connectivity is abundant, the paradigm of hub-and-spoke is no longer self-evident.

Position of the 'bank account' and various service providers in the value chain

End-users in the digital world have all sorts of accounts for various services. These accounts consist of a collection of attributes around an identifier. An account is the basis for all payment services and the different forms an account can take can be plotted in our model.

A special role is reserved for the 'bank account'. The bank account can be regarded as the cornerstone for a whole ecosystem of financial services. The importance of the position of the bank account is reflected in the fact that it is associated with legal rights and obligations making it therefore the focal point for various forms of regulation. Such regulation applies to both the financial aspects (deposit taking) of the account as to the specific requirements regarding identification of the account holder. The credit institution license corresponds with the requirements set for the provisioning of a bank account.

Next to the bank account, payment services can be offered from an e-money account. An e-money account also combines payment services with the holding of funds. The provider of e-money accounts falls under a different regime than the deposit taking credit institution and consequently, different rules apply: the e-money institution.

The third type of account that is relevant for this paper is the payment account that forms the basis for payment services, but is not associated with deposits or the holding of funds. For service providers offering payment services, a lighter regime applies: that of payment institution.

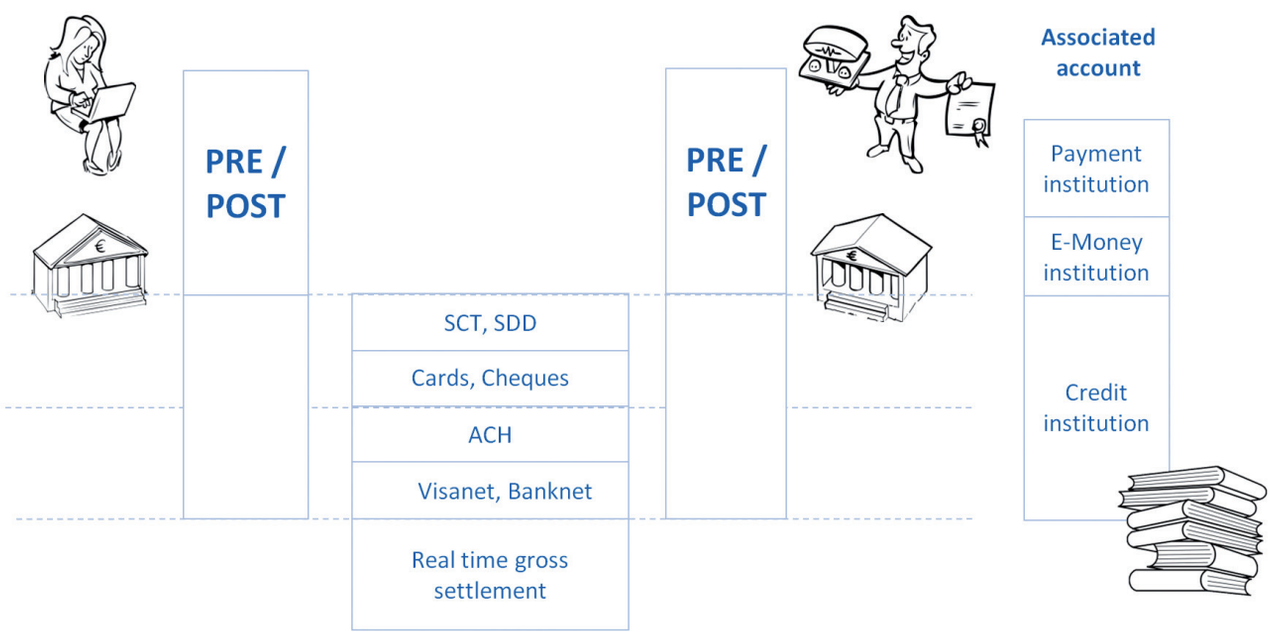


Figure 8: *Legal framework applicable to the various layers in the model*

It is important to realise that, to a large extent, the service providers that are active in the services layer are the same that operate in the traditional payment infrastructure. OBeP solutions, products built on top of the cards system and many payment services designed for mobile are examples of services that are offered by banks and work in conjunction with SEPA and card infrastructures. Recently, many innovative non-bank players have been moving into the services layer.

‘Access to the Account’ (as coined in the draft PSD2 of 2013) is not a new concept: it has manifested itself in the form of direct debits and cards, which has facilitated the strong growth of e-AP solutions. e-AP providers built their service on top of these core banking services.

This chapter explained that Internet technology enabled a separate layer of payment services built on top of the existing (and regulated) payment instruments. This has brought the following conclusions:

- **Information no longer travels exclusively with the funds through the infrastructure. End-users interact through parallel channels.**
- **The payment instrument that is used in the infrastructure layer to a large extent determines the regulatory framework that governs payment services, even while it may in some cases be hardly visible for the end-user.**

4. WHILE DEVELOPING SEPA, FRAGMENTATION REMAINED IN THE SERVICE LAYER

A major development, especially regarding the end-user requirement of 'reach', was the harmonisation of the European payment system towards SEPA: the traditional interbank payment systems (**figure 6**) now provided full pan-European reach, of which end-to-end trust for payers and payees is a key element. The cards network had already tackled this issue earlier; although significant areas exist in which certain card-related services do not provide full coverage.

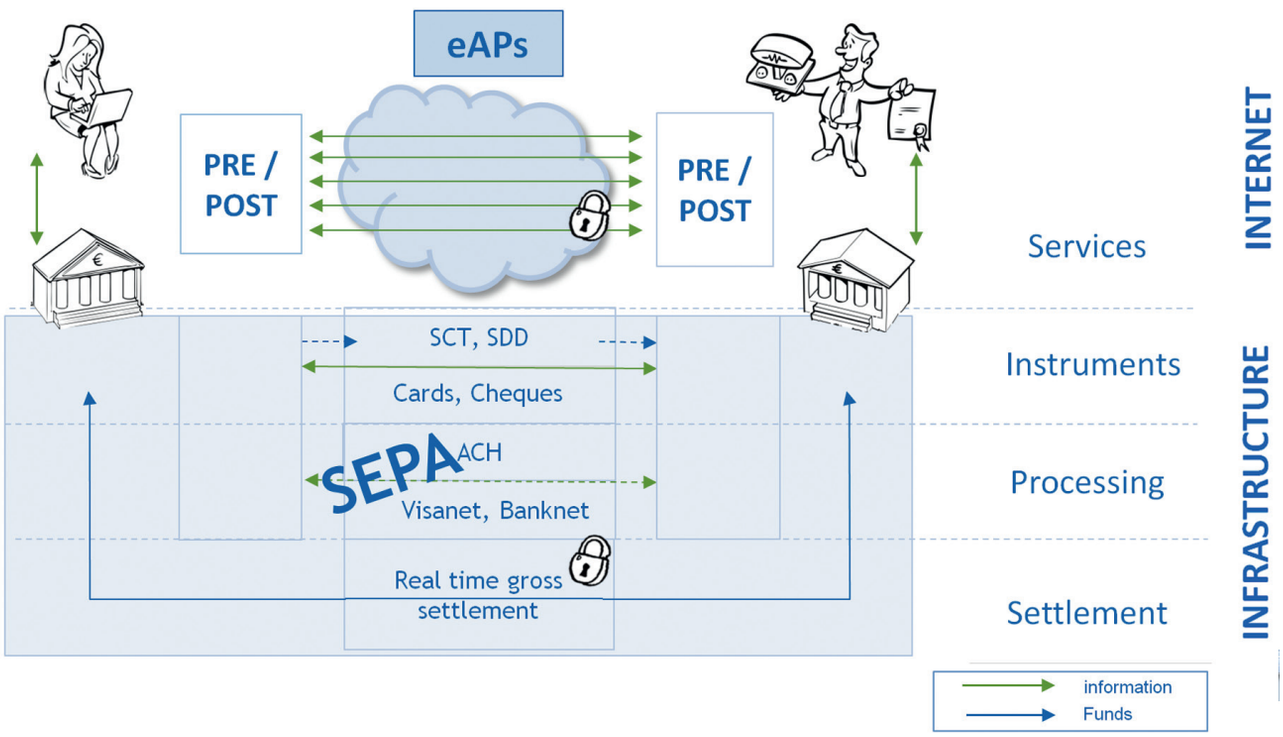


Figure 9: *SEPA provided reach in the processing and instruments layer, but not in the services layer*

It is important to realise that the harmonisation SEPA accomplished is only partly visible to end-users. As mentioned in the previous sections, the services through which end-users interact with the SEPA payment instruments are provided to them by their respective PSPs − be it online banking, paper alternatives or innovative services from the services layer.

With SEPA, traditional payment arrangements can now provide full reach, but only for that part of the service that is the payment. The services layer largely consists of local and specific solutions with limited reach, including limited trust. Because end-users rely more and more on the additional functionality that the services layer brings, this again contributes to a more fragmented landscape.

Two examples are Online Banking enabled Payments (OBeP) and e-mandates. Based on a common legal framework, provided by the Payment Services Directive (PSD), these services are built to make full use of the SEPA payment instruments, but are implemented in various ways across communities, leading to a fragmented landscape of solutions. This is typical for the whole category of e-AP solutions. This is illustrated in **figure 10**.

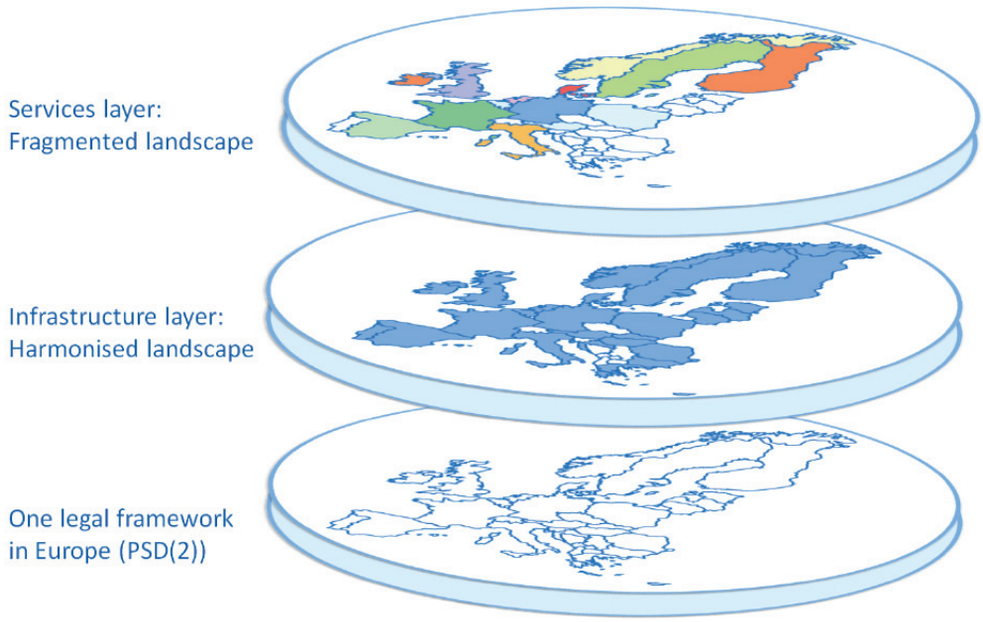


Figure 10: *Reach is limited for services built on top of SEPA payment instruments*

The conclusion of this section is that, although the harmonisation driven by SEPA satisfied end-users' looking for reach, it has only done this for the base instruments (SCT, SDD and cards). Those services that demand more functionality (or speed, like real-time online environments) rely on the non-harmonised services layer (as illustrated in **figure 11**), which lacks reach (i.e. end-to-end trust, standards and processes).

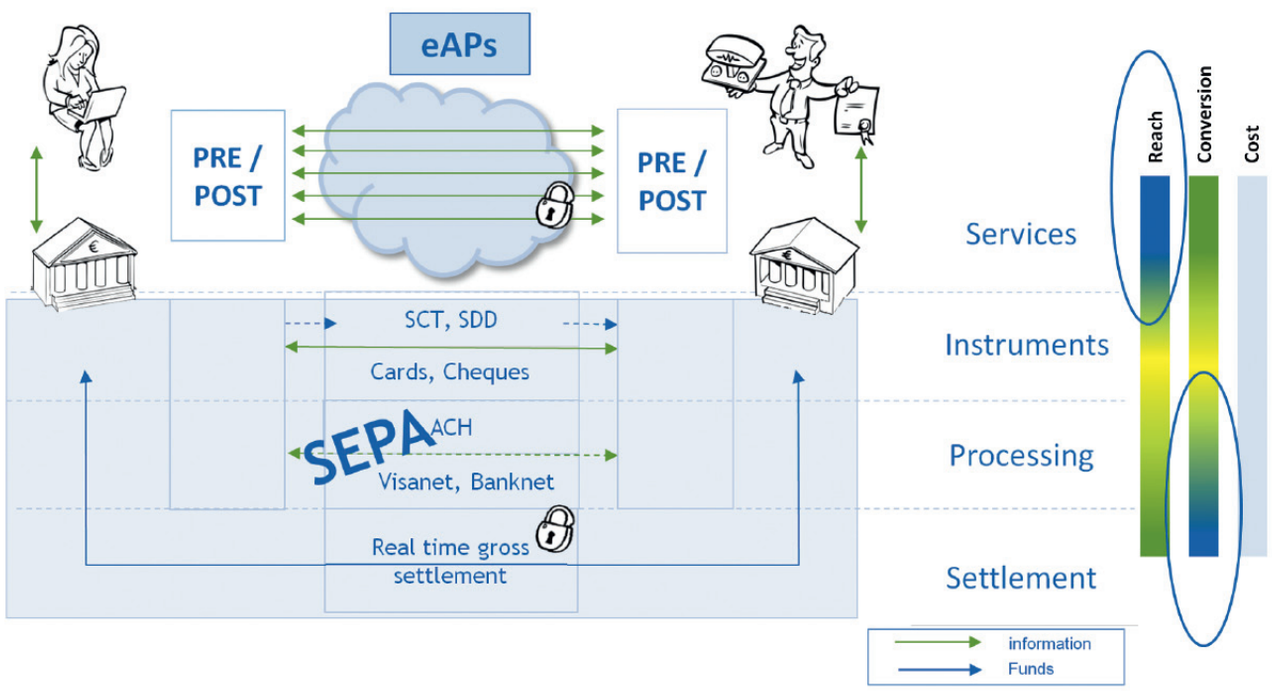


Figure 11: *User requirements (reach, conversion, cost) are met to different degrees by the infrastructure and the services layer*

SEPA makes specialised products available for niche markets

An important effect of SEPA is that services built on top of SEPA payment instruments that aim for specific user segments can now, with little or no local adaptations, serve their clients in the entire SEPA area. For retail payment solutions this can be an advantage, although the major beneficiary is the SME sector, where relatively small user communities can benefit from solutions that would otherwise have to be built for a very small audience.

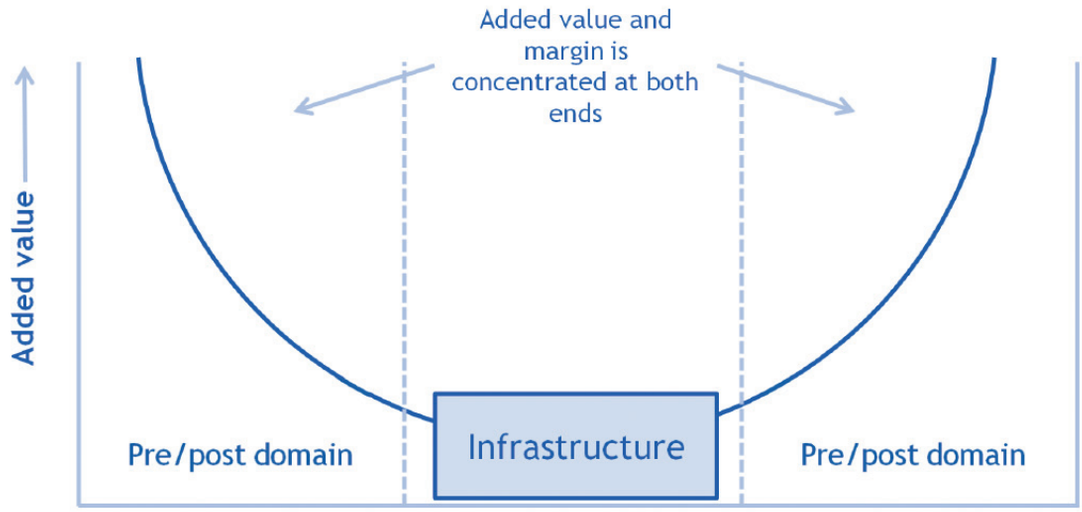


Figure 12: *The ‚smiley curve' represents the relative distribution of added value across the value chain*

As for the cost, or value, of the total chain for this service, we introduce the illustration in **figure 12**: the smiley curve. This illustration shows the relative distribution of added value across the payments value chain. The interfaces with the end-customer provide the best opportunities to add value, based on the specific needs of the customer. The service is relatively commoditised in the middle of the chain. However, as a result of the high investments associated with operating an infrastructure, the position in the middle is rather exclusive for payment service providers, but conditional for all (competing) actors at the same time.

The challenge for the parties active in this section of the value chain is to expand their services to both ends and provide higher added value for end-customers.

Real time: what is it really?

Real time payments are today's 'hot topic' for payment professionals, policy makers and regulators. At the same time there is a risk of unconscious confusion, because real time payments can mean different things to different people.

Are we talking about real time in the services layer or real time in the infrastructure layer? Or both? Is it real time 'money on the account' or real time 'information about the money' on the account? UK's Faster Payment is a near real time infrastructure, but MyBank, iDEAL and Giropay are examples of real time information in the services layer. Pingit and PayPal are also 'services layer' examples, albeit from individual market players. For the payer and payee the differences are hardly felt, except for payees that want their funds in real time instead of a guarantee of funds. This could potentially be solved by the creditor bank advancing a payment (based on a guarantee), without a need for real time infrastructure.

In today's reality, the transition towards real time should be looked at carefully. Real time in the services layer is much cheaper and faster to realise than real time all the way down into the infrastructure. For green field situations, real time could be implemented across the whole stack.

This chapter concludes with the observation that SEPA has established reach for a set of basic payment instruments (SCT, SDD and cards). This has greatly benefitted payers and payees, as there is now a solid and trusted basis for services to be built on. The basic instruments, however, do not always offer the full functionality that is required for meeting the advancing requirements of payers and payees in the digital domain, thus e-AP services fill this gap. However, the fragmented e-AP services space lacks the pan-European reach provided by end-to-end trust, standards and access to payment infrastructures.

5. THREE FORCES DRIVE SOLUTIONS THAT MEET END-USER REQUIREMENTS

Looking at the result of the developments described in sections 2 to 4, we see that the infrastructure layer is harmonised (scores high on *reach*), but does not offer the functionality that is needed in all contexts. At the same time the services layer offers rich functionality (scores high on *conversion*), but does not always offer the necessary *reach*.

This section will explore three forces currently at work (non-exhaustive) to better address end-user requirements regarding reach, conversion and cost. Two of these forces can be seen as the drivers of the formation of a 'Digital Services Infrastructure' (DSI, see paragraph 5.4). The industry should recognise these forces and optimise strategies accordingly.

The three forces are:

1. *Expand functionality*: Increasing functionality of the infrastructure layer

2. *Harmonise the services layer*: organising reach and end-to-end trust

3. *Paradigm change*: disruptive innovations that bypass the current infrastructure layer: new paradigm for infrastructure

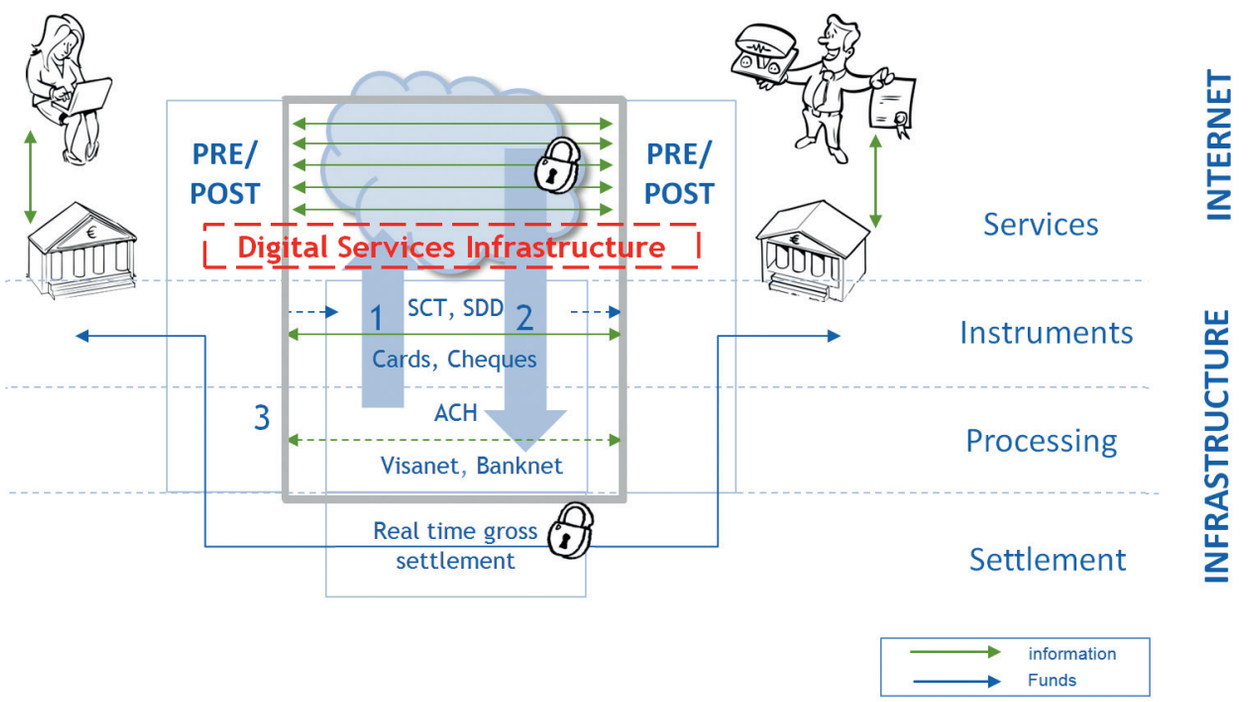


Figure 13: *Three forces influencing the further development of e-AP services*

5.1 Increasing functionality of the infrastructure layer

To increase the functionality of the infrastructure layer is arguably the most obvious way to meet more sophisticated end-user requirements.

Expanding the functionality could mean to enable more sophisticated messaging along with the funds. Examples are messages regarding confirmation of receipt or attachments. Another piece of functionality that is currently addressed in this layer (and adds value there) is enabling faster processing. Faster processing (shorter cycles or even 'in real time' processing) renders additional (information) services about the availability of funds obsolete: as the money flows in 'real time', it is no longer necessary to inform beneficiaries that the money 'will arrive shortly'. Last but not least is the offering of an interoperable digital identity infrastructure, in order to lay the foundation for end-to-end trust.

Expanding the infrastructure with these features would enable all providers to build their proposition to

end-customers on this, without the need for separate messaging channels. This would address two of the three user requirements for reach and conversion.

We see various communities taking this direction with 'real time infrastructures' (see blue box on page 19) as the most visbile development. Examples are the UK (Faster Payment), Sweden ('Payments in Real Time') and Singapore ('G3 Immediate Payments'). There is an emerging opportunity to create pan-European instant payments, building upon existing and future real-time infrastructures.

5.2 Harmonisation of the services layer

The alternative for expanding the capabilities of the infrastructure is to harmonise a part of the services layer to accomplish *reach*. Harmonisation in the services layer can take different forms. Rather than developing e-APs (e.g. payment initiation services) on a "per bank" or national basis, the ambition could be for instance to replicate the idea behind SEPA in the services level. This would imply some form of stand-ardisation in a technical, functional, operational and legal sense, creating common 'building blocks' for the industry to use. These components could jointly evolve into the 'digital services infrastructure'.

Harmonisation would add *reach* to the rich functionality of the services layer. As mentioned, this functionality addresses specific user requirements and provides *conversion*, i.e. end-user functionality requirements are met in a better way. Harmonisation can be achieved either by offering services on a SEPA-wide scale or through interoperability.

An observation is that, in Europe, regulation is pointing in this direction. The revised Payment Services Directive ('PSD2') clearly indicates that the regulator takes the services layer in scope and does not limit itself anymore to the traditional payment service providers, as was the case with SEPA. The section on 'Access to the Account' of PSD2 aims at harmonising the services layer by stating requirements for bank and non-bank players offering services in this domain, standardisation and setting minimum service levels. Other regulatory interventions also add to this broader scope: Secure Pay, eIDAS, AML4 and the General Data Protection Regulation. These regulations also strongly point towards a harmonised digital identity infrastructure that should be seen as a hygiene factor in the services layer. Digital identity solutions from the (already) regulated banking sector will facilitate the smooth interfacing between the services (e-AP) and today's payment infrastructures offering end-to-end trust in this domain.

Alternatively, payment gateways solve fragmentation for merchants and wallets could do it for consumers

A counterforce to this scenario is the development of 'payment gateways' or 'internet PSPs': service providers that enable merchants to accept a large number of payment methods with little effort. This has been a development over the last 5-7 years as a response of the market to the growing number of payment methods and growing complexity for merchants. It gave rise to a whole new category of payment players and a lucrative market for commercial payment services.

Recently, we have been witnessing a similar development on the side of the consumer. The multitude of payment methods and associated services has brought so much complexity that there is now a role for consolidators on the consumer side: wallets on mobile devices. One way to look at a wallet is to see it as a service for consumers to centralise access to a range of payment instruments. Looking at it like this, the phenomenon replicates what we have seen on the merchant side.

Wallets provide consumers with one user experience, irrespective of the underlying payment service. It is very easy for consumers to participate in various digital services, since onboarding and usage become easier over time.

5.3 Disruptive innovations that bypass the current infrastructure layer

The third scenario for future development that industry players should be aware of is the introduction of disruptive innovations that do not merely build on top of the existing infrastructure, but bypass it altogether. These can be summarised as 'distributed consensus' network technologies, as opposed to 'centralised consensus', which is the design principle of most public sector and financial institutions. Examples of such disruptors are Ripple or Bitcoin, which are built on the technical concept of 'block chain'. Believers in these developments regard these decentralised networks as potential alternatives to automated clearing houses ('ACN' instead of 'ACH'). It should be noted though, that certain regulatory tasks that are currently fulfilled by the ACHs would also need to be addressed in alternative scenarios.

In general, there are various so-called 'crypto currencies', which can be seen as 'digital assets' with no perceived counterparty risk. Bitcoin is the most famous one, but others include Litecoin, Dogecoin and Next. Crypto currencies use advanced encryption technologies managed by the end-user and therefore claim to provide both safe storage and transactions without intermediaries and directly on to Internet devices. The decentralised nature of these crypto currencies enables developers to build highly specialised products on top of the basic payment functionality. Although currently their use is limited to certain parts of the Internet community and the usability of crypto currency-based payment services leaves room for improvement, they have the potential to fulfil the end-user requirement of *conversion*. *Reach* is the other challenge for this category of services as it will take a certain critical mass to become relevant outside its current niche economy.

The regulated financial infrastructure is a critical component, because of the exchanges, which need to be able to settle in fiat currencies as well.

Ripple

Ripple is a service that can be used for payments, exchange of currency (and potentially any other unit of value) and remittances over the Internet. It was first developed in 2004, with updates in 2011 incorporating Bitcoin. The software is developed by Ripple Labs, which has made it open source. The system consists of several components: a decentralised protocol, a consensus ledger shared by all participants, which also contains an order book, and a native currency called ripples (XRP). Although exchange between individual participants peer-to-peer is supported, normally each participant connects to one or more trusted gateways where many participants have accounts that enable users to put money in or out of the network.

The key element in the Ripple network is the shared and distributed public ledger. It holds information about all participants' balances as well as offers to buy or sell currencies and assets.

Inside Ripple, transactions occur in near real time. However, when processing anything other than the native Ripple currency, the transaction to convert Ripples back to the currency of choice is done through the traditional infrastructures with the according timelines. Besides the native Ripple currency, Ripple supports the exchange of any fiat currency (euros, dollars, yen etc.), virtual currency (Bitcoin, Dogecoin, etc.), commodity or other value instrument (e.g. loyalty points).

According to Ripple, the service is an efficient and secure, Internet-based competitor to financial communication infrastructures and clearing houses as it allows irrevocable, near real-time payment and settlement.

6. WAY FORWARD FOR THE INDUSTRY: DIGITAL SERVICES INFRASTRUCTURE

A challenge for the players that are currently active in the infrastructure layer is that newcomers in the services layer are claiming an increasingly large part of the value of transactions. As these services are becom-ing richer, they are economising on the use of the traditional payment instruments.

One possible response by established players could be the creation of a 'Digital Services Infrastructure'. The DSI will enable e-AP to create end-to-end trust (*reach*), while leveraging their specific functionalities towards payers and payees. This is depicted in red in **figure 13**. It should be noted that the term 'infrastructure' is used here to refer to a non-physical construct of standards for technical, operational, functional and legal matters.

Extending today's Digital Identity Infrastructures towards the services layer seems to be a "no regret" option going forward. However, as this important topic is all about customers and their requirements, it concerns all organisational silos in today's financial institutions. It is not a pure payments play anymore and requires a unified approach. Financial institutions can greatly benefit from such infrastructures when it comes to products, security and onboarding new customers.

All three of the above forces demand a different approach from individual players in the payments value chain. At the same time, it is very likely that the three forces will co-exist, albeit in different shapes and forms across the various communities throuhout Europe.

Industry players should consider whether they want to meet the challenges of the three forces pro-actively or rather wait and react when there is more clarity about the direction the industry is moving into. Also, they should decide whether the developments in the services layer demand industry measures or should be met with actions by each player individually.

These four approaches are illustrated in the table below. Of course, collaborative action could and should be taken in parallel with individual actions.

	Reactive	Pro-active
Collective (interbank)	A collective reactive approach is aimed at the mitigation of adverse effects of new developments and incremental adjustments to accommodate to the new situation.	A collective pro-active approach is aimed at meeting progressing customer demands. Both collective actions in the infrastructure layer and in the services layer fall in this category.
Individual (interbank)	Individual industry players should assess the potential effects of the developments described above and formulate a strategy that can be successful in each scenario.	Individual players can also follow a more offensive approach and, for instance, develop services themselves that increase their relevance in a fragmented services layer.

Figure 14: *Four approaches for actions in creating the Digital Services Infrastructure*

It is not within the scope of this opinion paper to advise individual market players in their choice between the different courses of action. However, we do recommend actions (non-exhaustive list) that we see as 'no-regret':

1. **Understanding the implications of the growing e-AP services layer**:

   The developments in the services layer have far reaching implications and the industry at large will benefit from a joint learning experience. In any scenario, there will be a need for the 'digital service infrastructure', simply because standardisation is the way forward in two-sided markets

with many competing players. Many actors have to expand their frame of reference to incorporate new categories and services as well as develop a language that enables the exchange of ideas and best practices. This document is a first step in this direction.

2. **Experimenting:**

   The success of the services layer is partly explained by the amount of experimenting going on there. Payment practitioners are encouraged to investigate new paradigms outside their comfort zone, such as digital identity services and APIs.

3. **Planning for change**:

   Against the background of continuous and accelerating change, industry stakeholders (ranging from customers to regulators) expect change to happen. Banks need to plan ahead for this change and communicate to the outside world to manage expectations. Otherwise, the role of the banking industry on the supply side risks to lose relevance.

In the upper right category, the EBA can contribute to a collaborative effort where

a) a set of common requirements could lead to a more harmonised services layer: a **Digital Services Infrastructure** (**figure 13**) and

b) common requirements for a Europe-wide instant payment infrastructure are articulated.

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 the account.
Alternative Payments (e-AP)	Innovative non-card payments that have been developed in the last decade. More specifically, payments where no 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.
Anti-Money Laundering (AML) requirements	Legal controls that require financial institutions and other regulated entities to prevent, detect, and report money-laundering activities.
Authentication	The act of verifying an attribute of a person or entity.
Authorisation	The process of initiating a payment by verifying that you are who you say you are and are authorised to do so.
Automated Clearing House (ACH)	An electronic clearing system in which payment orders are exchanged among participants (primarily via electronic media) and handled by a data-processing centre.
Card payment	A payment initiated with a card (or a CNP alternative) and processed through one of the card networks (either international or domestic).
Channel	Medium through which parties interact. In this discussion paper the channel refers to the device on which a transaction is being initiated.
Charge-back	Revoking a payment initiated by the payer. When the merchant initiates the payment, it is typically referred to as 'refund'.
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.
CNP	'Card Not Present': a payment context where payer and payee are not in the same place and where the payee has to rely on alternative methods to verify the authenticity of the card and the cardholder.
Collaborative domain	The collaborative domain is the area where players cooperate in order to lay the foundation for competitive services.
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, we mean parameters like relation, channel, product, etc.
Conversion	In this paper, the term '*conversion*' is used for the extent to which functional user requirements are met. For consumers and merchants, conversion is what makes a payment experience fit the context. For merchants, conversion is what determines the probability a potential buyer becomes a customer.
Cost	In this paper, the term '*cost*' refers to the total cost of payment solutions, including that of the associated administrative burden, fraud or fraud prevention, 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.
e-APWG	Electronic Alternative Payment Working Group.
E-Commerce	Trading in products or services conducted via computer networks such as the Internet.
E-Identity	Identity services in an online context, typically aiming at increasing trust between interacting parties (e.g. consumers and merchants, 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 the retailer and consumer.
E-Payments	Payment instructions that enter a payments system via the Intern 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 new, innovative payment products.
E-Service	Service that is executed online, facilitating the interaction between, for instance, consumers and merchants or governments and citizens.
Four party model	Concept for service provision in two-sided markets where services are provided for both sides of the market by dedicated service providers, 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 that 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	Payment instruments belonging to a given scheme may be used for 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 respective schemes.
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 provide services for customers whose identity they cannot verify. 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 initiated via wireless electronic devices such as hand-held computers, mobile phones or laptops.
OBeP	Online Banking electronic Payment (OBeP) refers to a 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 a 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.
Payment Service Provider (PSP)	A 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.
Point Of Sale (POS)	Point of Sale (also called POS or checkout or, in an online context, electronic point of sale or EPOS) is the place where a retail transaction is completed.
Processing	The performance of all 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 (ECB 2010).
PSD	Payment Services Directive
Reach	In this paper, the term 'reach' is used for the number of actors an end-user (consumer or merchant) can connect to in a trusted environment. End-to-end trust is an important part of this reach and differentiates 'reach' in payment services from that in less sensitive environments. For merchants, *reach* is what distinguishes 'visitors' from 'potential buyers'.
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 a financial market transaction; (2) the settlement is not time-critical; (3) the payer, payee or both are individuals or non-financial organisations and/or (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 Euro 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.
SEPA Direct Debit (SDD)	SEPA Direct Debit (SDD) allows a creditor (biller) to collect funds from a debtor's (payer's) account, provided that a signed mandate has been granted by the payer to the biller.
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.

ANNEX A: END-USER REQUIREMENTS

In the "Opinion Paper on Next Generation Alternative Retail Payments: User Requirements", the EBA Working Group on Electronic Alternative Payments (e-APWG) defined nine core requirements that future e-AP products should meet. For the purpose of this paper, these nine requirements are combined with the three themes set out by Ecommerce Europe: *reach, conversion* and *cost*. **Figure 15** gives a comprehensive overview that will be explained in more depth below.

	Reach	Conversion	Cost
Ease of use – Simple / Simpler Solutions:		✓	
Mobility / Multichannel:		✓	
Free - Low Cost:			✓
Safe and Secure:		✓	✓
Unbanked and Anonymity:	✓		
Real-time Immediacy:		✓	
Flexibility and Choice:	✓	✓	
Preferences Specialisation:	✓	✓	
Returns / Refunds:	✓	✓	

Figure 15: *Integration of the nine e-AP requirements into the three themes of Ecommerce Europe*

1. Ease of use: This refers to the simplicity that users prefer when using payment solutions. Consumers and retailers want simple solutions that lead to increasing sales conversion rates and satisfied customers.

2. Mobility and Multi-channel: With the availability of multiple channels, a payment can be made anywhere and anytime, leading to higher conversion rates.

3. Free and Low cost: Consumers expect payments to be free of charge and merchants seek for lower-priced solutions.

4. Safe and Secure: Consumers increasingly worry about the security of personal data when making a transaction. When not feeling secure, they will be less likely to use a particular solution. Retailers fear the risk of security breaches that could lead to a loss of customers.

5. Unbanked and Anonymity: There are still groups of unbanked citizens that wish to participate in e-commerce and make anonymous payments. e-AP solutions should offer this possibility, for which *reach* is a key requirement.

6. Real-time solutions: There is a growing demand for real-time solutions from retailers and consumers. When e-APs meet these real-time requirements, this is expected to lead to higher conversion rates.

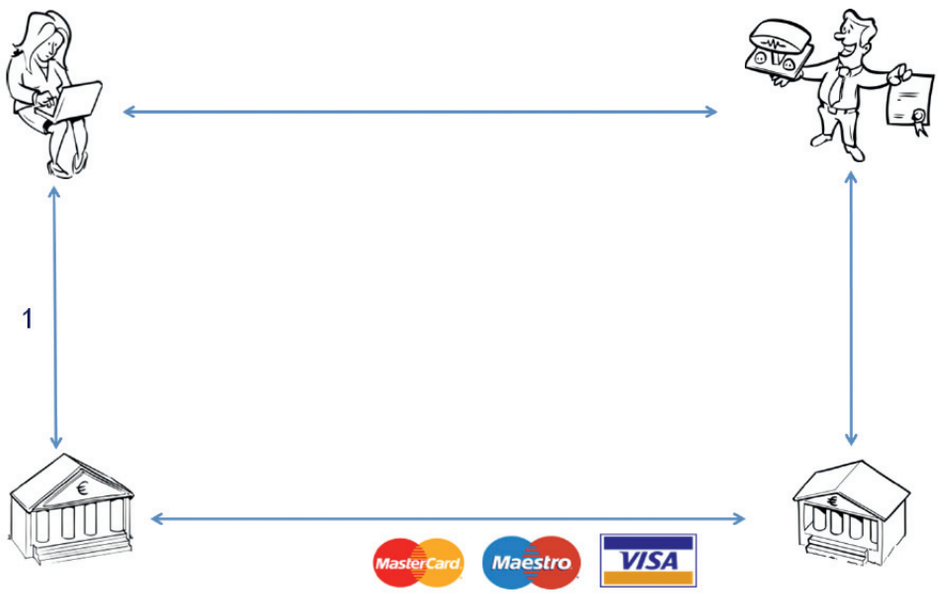
7. Flexibility and Choice: e-AP solutions should meet particular user demands. Merchants need flexible PSPs that offer many acceptance methods to meet these demands. Offering flexibility and choice in terms of payment methods leads to wider reach and higher conversion rates.

8. Preferences Specialisation: As both consumers and retailers expect e-AP solutions to meet specialised requests of their respective market segments, a single service is no longer sufficient or suitable. Different user segments request different e-AP solutions. Meeting these requests will increase reach and lead to higher conversion rates.

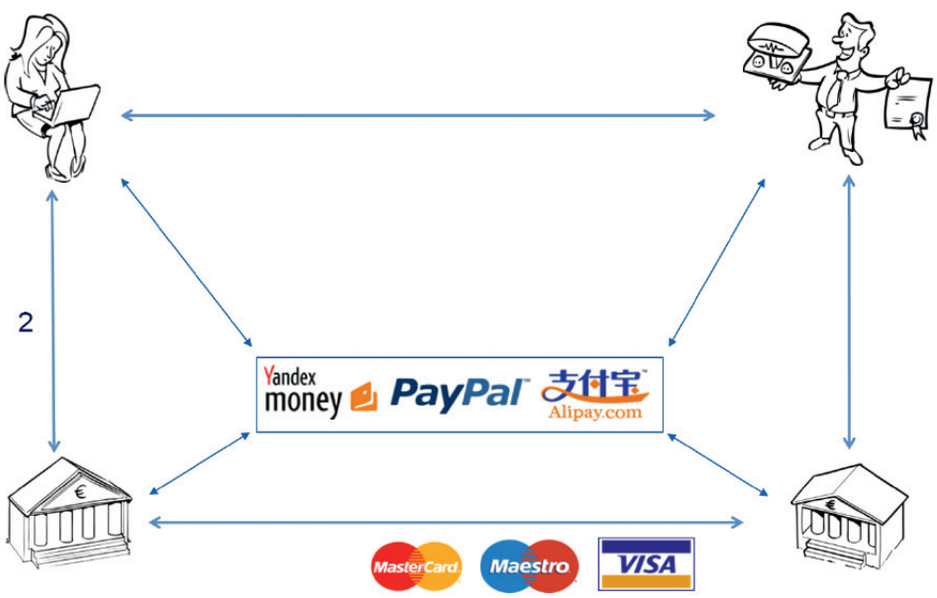
9. Returns/Refunds: e-AP solutions should offer easy and speedy return and refund processes that meet the needs of both consumers and retailers. As this also concerns outlets and locations that are not owned by the original merchant this requirement fits the *reach* dimension. Offering the possibility to return goods will also lead to higher *conversion* rates.

ANNEX B: THE EVOLUTION OF THE E-COMMERCE PAYMENT ECOSYSTEM

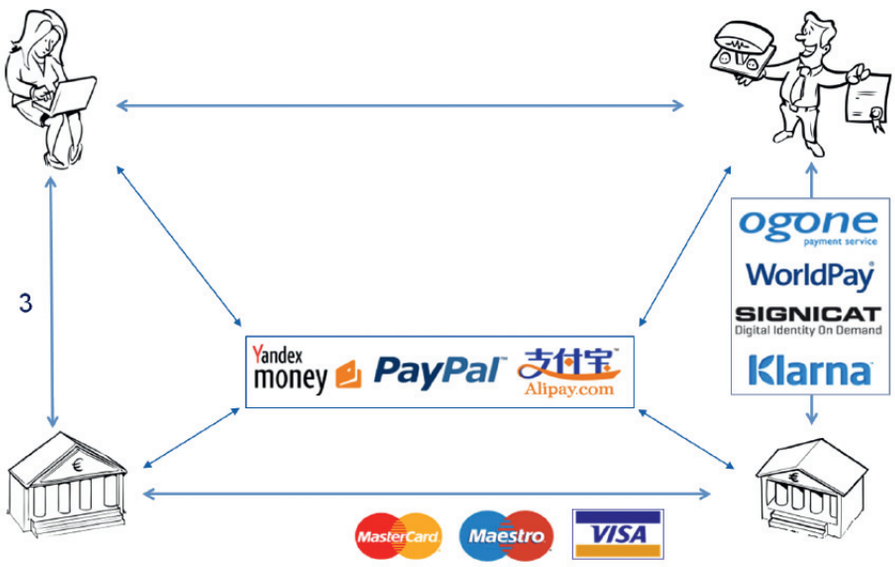
1. Around 1995, the first payments on the Internet are made via existing instruments. The main instruments are credit transfers, direct debits and cards. These instruments were used in physical contexts, too, for example for bill or salary payments.



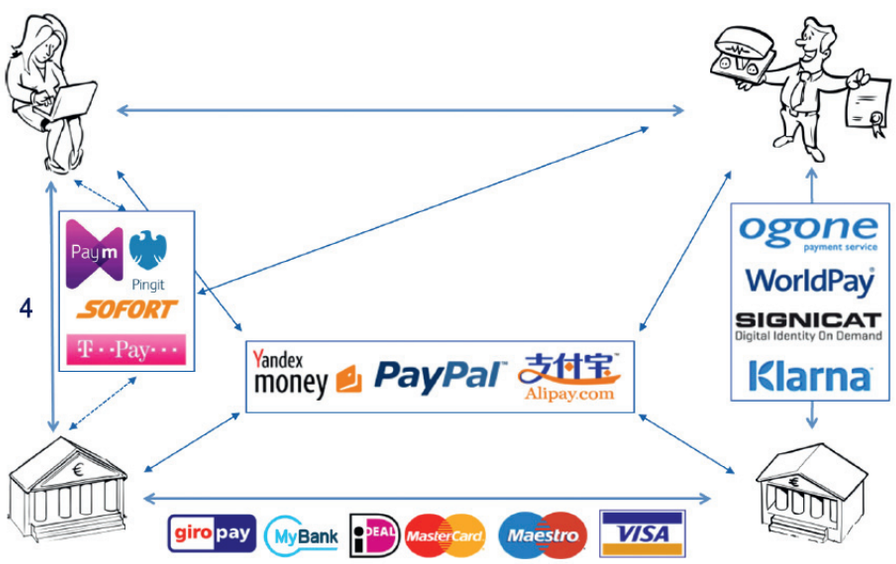
2. As e-commerce is growing rapidly, the first payment platforms appear around the year 2000. These platforms are positioned between banks and their retail and business customers. As these platforms introduced a new layer in the payment infrastructure, they can be seen as the first payment solution developed exclusively for the Internet, with PayPal as first leader in this new segment. The banking industry facilitated this rise of payment platforms completely because credit cards (and later direct debits) were the funding method of these payment platforms, offering reach to buyers and sellers by connecting their accounts.



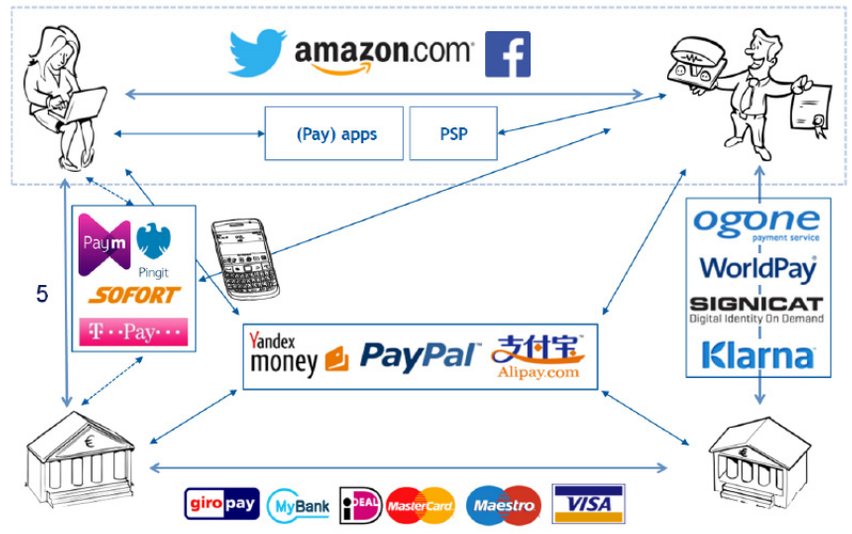
3. As the amount of payment options for buyers and sellers grew, the need for 'simplification through aggregation' grew as well, leading to dedicated payment service providers (PSP). PSPs offer merchants a variety of payment options and function as a (one connection) gateway between merchants and the acquirer. These parties were newcomers and usually non-bank players. In 2009, these entities became regulated as 'payment institutions' under the first PSD.



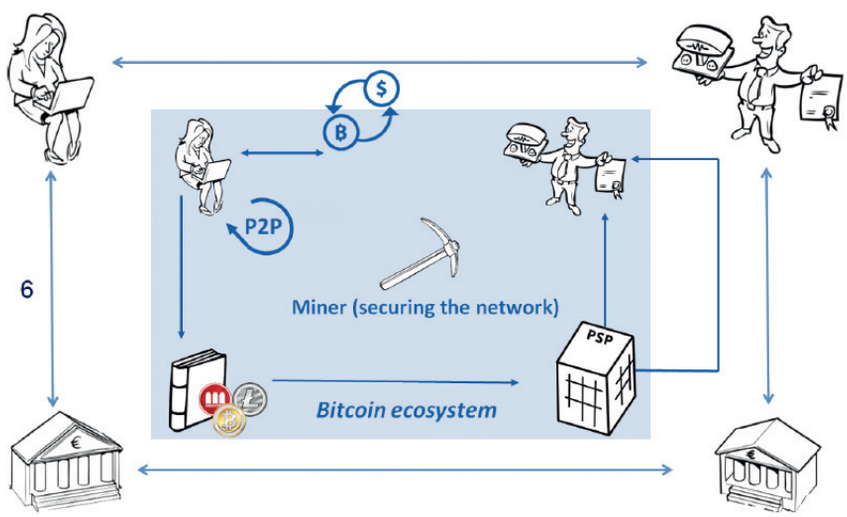
4. As a reaction to the growing amount of payment options, some banks saw the opportunity to dedicate themselves to Internet-driven product development. These resulted in a separate stack added to the infrastructure, the category of Online Banking ePayments (OBeP). These types of payment networks are based on the banks' own online banking infrastructure and regular credit transfers and enables consumers to pay an e-commerce purchase directly with their online bank account authentication credentials. There is more attention for interoperability now. iDEAL, MyBank, Giropay, EPS and Przelewy24 are examples of services that were developed by banks together and enabled reach for consumers. A special breed of OBeP are the so-called 'Third Party Payment Initiation Services' (TPPIS) that give online banking e-payment options to consumers, without actually engaging the issuer bank.



5. In 2007, the first iPhone is introduced. E-commerce and e-banking are no longer exclusively bound to the PC. With the use of a smartphones consumers are able to buy digital applications via, for instance, the app store, conduct in-app purchases and direct purchases via mobile browsers. As a result of the mobile revolution, together with the further advance of 'general' e-commerce, so-called 'continents on the web' emerged: online merchants (e.g. Amazon, Facebook, Google, Twitter, Alibaba, Tencent, Allegro) that attract so many users that they were able to develop their own dedicated merchant ecosystem including payment solutions or even their own currencies. Facebook for example launched their own currency in 2011 with Facebook Credits, which lasted only a while, and is exploring possibilities for their own remittance system, expected in 2015.



6. Since 2010, we have seen the rise of a totally new phenomen on that is less dependent on the traditional payment system. Crypto currencies, coming from a whole new paradigm of 'block chain' allow users to exchange funds without formal intermediaries (such as banks and other payment providers), challenging the basic idea that trusted third parties play a role in the exchange of funds between economic agents. Basically, the block chain allows for transactions without central (platform) parties like banks or other payment providers. A major part of the existing stacked ecosystem can be skipped when doing a transaction. The traditional payment infrastructure is only used when crypto currencies are traded for fiat currencies.



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