# Open banking: The rise of the cloud platform

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## Abstract

*This paper explores how traditional banking system architectures will be affected by the emergence of open banking. Platform models for open banking are proposed that accommodate both supply and demand-side solutions. On the demand side, the network effects of open banking platforms and their limitations are discussed. Using a feedback model of platform behaviour, it is suggested that the long-term success of open banking can be directly coupled to the emergence of such platforms and their regulatory scope. To inform the architectures to support open banking, the unique transactional characteristics of open banking solutions are determined. The essential role of cloud technologies in meeting these characteristics and hence the propensity for their use in the implementation of open banking platforms is illustrated. Specific types of open banking platforms are then described in terms of their essential architectural components and collaborations. The benefits to account servicing payment service providers and to third-party providers in adopting such open banking platforms are highlighted.*

*Keywords: PSD2, open banking, cloud platform, FinTech, banking architecture, BaaS*

## INTRODUCTION

The introduction of new financial market regulation, notably the revised Payments Services Directive[1] (PSD2), has forced banks to open up payment-related banking services to third-party providers (TPPs). The regulation is considered an important enabler for the creation of new and innovative customer propositions. Consequently, this sees the introduction of competing services into the banking and payment services market. PSD2 is perhaps recognised as a trigger for the wider concept of 'open banking' in which a rich variety of banking services are offered by banks and consumed by a mix of TPPs, business partners and industry bodies.

While the ideas in this paper apply to the wider concept of open banking, the paper uses examples and terminology from PSD2 to illustrate the key points.

Open banking has led to a corresponding rise in financial technology organisations (ie FinTechs). Indeed, information pertaining to the take-up of open banking services confirms that 94 per cent of FinTechs view open banking as a major area of opportunity.[2]

PSD2 mandates banks (account servicing payment service providers [ASPSPs] in PSD2 nomenclature) to provide access to payment accounts to licensed TPPs. Three core tranches of payment services are required to conform to the directive:

- *account information:* providing a variety of information relating to a customer's payment accounts, including balances, standing orders and direct debit information;
- *account transaction history:* providing the sequence of payment account transactions over an arbitrary specified period; and
- *payment initiation:* providing the capability to submit payments orders to an ASPSP — this capability includes for the ASPSP to send, upon request, an immediate yes/no confirmation to the TPP on whether or not there are funds available.

In the new economic model enabled by the regulation, ASPSPs constitute the supply-side participants. FinTechs, in the guise of account information service providers (AISPs) and payment initiation services providers (PISPs), use these services and these market actors form the demand-side participants, providing new propositions to meet customer demand. The new market dynamics give rise to the requirement for IT solutions that are derived from a combination of both traditional banking services and new FinTech services, creating a broader 'banking marketplace'.

This poses an interesting question regarding what constitutes the optimal IT architectures to support these marketplace solutions.

To answer this question, this paper explores how traditional banking system architectures are impacted in order to support new customer propositions, enabled by the regulation and provided by the FinTechs. In this respect, a 'platform' model for open banking services in the style of say, Uber, Amazon and Spotify is presented. This model is used to provide a high-level analysis of open banking and the extent of the market growth that may be achieved.

## OPEN BANKING AS A PLATFORM

### Platform overview

In brief, a platform is a business based on enabling value-creating interactions between external producers and consumers. The platform provides an open, participative infrastructure for these interactions and operates within governance conditions set for them. The platform's overarching purpose is to consummate matches among users and to facilitate the exchange of goods, services or social currency, thereby enabling value creation for all participants.

### Platform approach applied to open banking

Applying this concept to open banking, two fundamental platform types are identified:

- platforms provided by the FinTech TPPs and used by payment service users (PSUs); and
- technical service provider (TSP) platforms that are offered by unregulated entities and that provide an outsourced technical service to either of the ASPSPs or the FinTech TPPs

#### *Third-party provider platforms*

In the context of PSD2, TPP platforms match users in the form of PSUs to their payment accounts provided by ASPSPs and make use of the essential payment use cases. TPP platforms are modelled as business to consumer platforms and their interactions are shown in Figure 1. The services and associated value units can be summarised as follows:

- *product comparison:*
  - recommendation on new financial products
  - ability to initiate product switches
- *money manager:*
  - alerts on pending transactions and balances

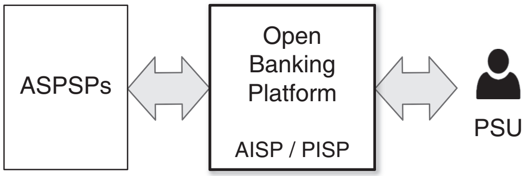


*Figure 1: Third-party provider platform interactions*

  - avoidance of fees and charges
  - ability to sweep money
- *neo bank:*
  - niche banking services not available from commodity banking products
- *contextual payment services:*
  - niche payments services
  - loyalty points programmes

In this scenario, it is the AISP and PISPs that provide the platform, while the platform user is the PSU. In this respect, potential network effects are huge given that the prospective user base comprises many millions of payment accounts holders.

### Technical service provider platforms

A technical service provider is a non-regulated participant in the PSD2 ecosystem. TSPs provide services on behalf of a regulated entity and provide the necessary IT components to implement the required PSD2 services. Standards for PSD2 access to account services (eg Berlin Group[3]) universally employ application programming interfaces (APIs), these being the *de facto* standard for business-to-business (B2B) interfaces over the internet. For the purpose of the present paper, these PSD2 interfaces are denoted 'regulatory APIs'. Further, as the ecosystem expands to accommodate broader open banking services, there is an expectation that these additional services will also be implemented using APIs. TSP platforms can also accommodate such open banking services.

Two forms of platforms are identified:

- *supply-side TSP platforms:* providing technical services for an ASPSP, hosting the regulatory APIs on their behalf; and
- *demand-side TSP platforms:* providing technical services on behalf of the AISP and PISP participants, consuming the regulatory APIs.

TSP platforms are B2B platforms and their interactions are shown in Figure 2. As such, network effects are less relevant as the user base is much smaller, comprising regulated entities rather than individual account holders (PSUs). The services and associated value units can be summarised as follows:

- *Supply-side TSP* — hosts the regulatory APIs on behalf of the ASPSPs:
  - cost savings for ASPSPs through reduced development effort;
  - reduced operational costs for ASPSPs due to the economies of scale of the TSP platform and software as a service (SaaS) pricing model;


*Figure 2: Technical service provider platform*

– increased agility as the TSP can respond quickly to deploy new APIs.

- *Demand-side TSP* — implements IT infrastructure for TPPs:
  – cost savings for TPPs through reduced development effort;
  – reduced operation costs due to the economies of scale of the TSP platform and SaaS pricing model;
  – reduced barriers to entry due to lower implementation effort and reduced IT expertise requirements.

## The open banking platform virtuous cycle

The key characteristic of a platform business model is that the more users of the platform there are, the more value is created for the participants. This is known as the virtuous cycle and was originally applied by David Sacks to the Uber platform model.[4] In the Uber virtuous cycle, the key network effect was identified as geographic coverage, ie the more drivers participate, the greater the geographic coverage and the greater value provided to the riders. An adaptation of this cycle, applicable to open banking, is now proposed.

Figure 3 illustrates the suggested key network effects of a TPP open banking platform. The central hypothesis of the model is that the value to each of the participants grows in relation to the growth in account data. The value growth for each of the participant types is summarised as follows.

- *TPP:* increased revenue from new innovative products derived from better insights from the payment account data;
- *ASPSP:* increased customer and payment account volumes from the provision of new products tailored to open banking characteristics;
- *PSU:* new and innovative services to help money management and provision of convenient access to payment services; and

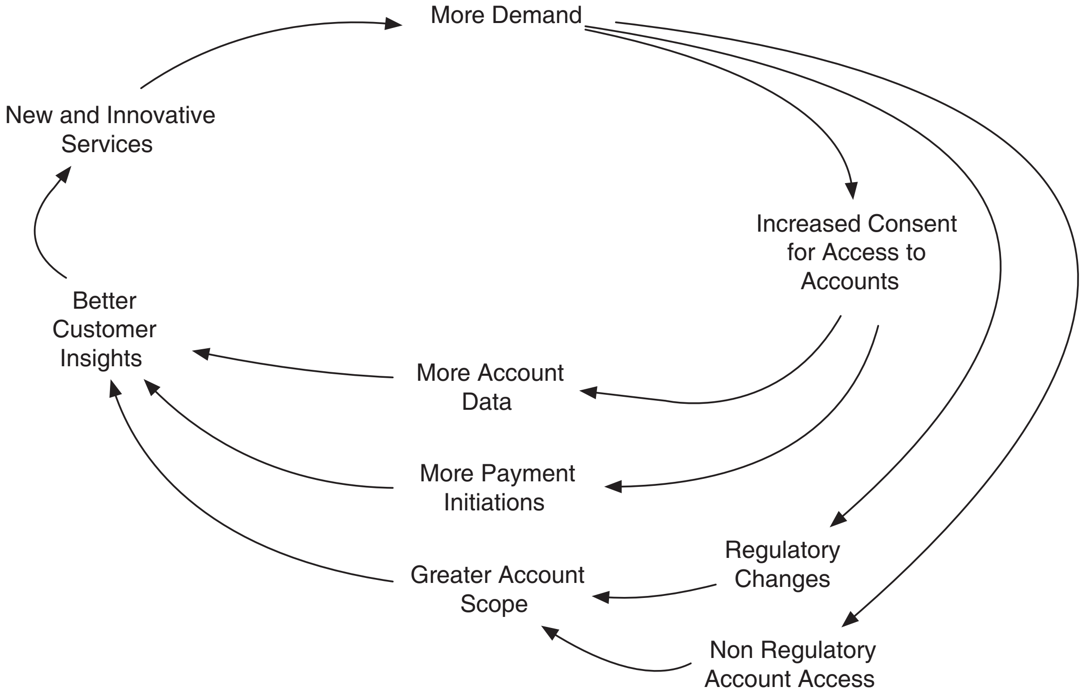


*Figure 3: Open banking virtuous cycle for TPP platforms*

- *TSP:* benefit proportionally from increased transaction volumes, assuming a SaaS pricing model.

In this open banking model, account data are analogous to geographic coverage in the Uber virtuous cycle. The feedback loop works as follows:

1. Demand is created as FinTechs propose new open banking propositions based on customer insights.
2. Account data accumulate as PSUs consent to use open banking propositions.
3. PSU demand can eventually act as a catalyst to drive changes in the regulation or for ASPSPs to voluntarily provide access to more account types leading to greater and more diverse data.
4. Increased consent and widening of account scope leads to richer and broader account data and further potential for better customer insights.
5. Go to 1.

## Platform network effect limitations

Platforms such as Uber, Amazon and Spotify achieve, or have to the potential to achieve, truly global reach. In the case of TPP open banking platforms there are factors to consider that limit the network effects of such platforms.

First, a TPP must consider the regulatory jurisdiction. In the absence of a global regulator, there are network limitations defined by regulatory scope, which is typically a jurisdiction based on country. (In the case of PSD2, while this is a pan-European directive, this must be translated into law in each specific country within the EEA and is thus regulated on a per-country basis by a national competent authority.) A TPP must be authorised by the regulator of a specific EEA member state; however, it is allowed to passport its licence to other member states within the EEA. Thus, AISPs and PISPs are, after passporting, entitled to access accounts across all EEA member states, meaning that the potential network effects will still be considerable. However, a further factor to consider is that the underlying ASPSP financial products (the payment accounts) are relevant only in the domicile of the PSU. Thus, certain propositions from TTPs will have relevance within a given member state only.

Consider first AISP services. While a TPP open banking platform may, subject to the relevant authorisations, technically operate across multiple jurisdictions, logically its accumulated data, customer insights and underlying accounts and customer services are most relevant to a local market and jurisdiction. For example, for a platform making recommendations for a product switch, it would only be sensible to make a recommendation for a product based in the same jurisdiction. Similarly, PSU behaviours may vary per local market, hence obtaining customer insights at the global level may have limited value.

Consider now PISP services. The scope of the PSD2 payment initiation service caters only for the initial payment order submission. The payment order fulfilment may be completed by any number of credit transfer payment schemes, as determined by the payer's ASPSP. Global, cross-border and cross-jurisdiction payments are therefore possible for a TPP that is authorised in the payer's account domicile. In terms of service reach, accessibility of the beneficiary account to the TPP is therefore not the key issue; rather, it is the accessibility of the payer's account to the TPP that determines the reach. Reach of the PISP payment initiation service is therefore limited by the TPP's authorisation; they must be authorised within the jurisdiction of the payer's account.

In Europe, PSD2 does enable pan-European reach for PISP services as TPPs are allowed access to accounts for all EEA countries, subject to passporting rights. However, the standards employed for payment initiation represent a practical barrier to the effective implementation of this. In the absence of a single, mandated standard for payment initiation, a PISP is presented with the technical challenge of implementing multiple standards for access to accounts to initiate a payment for a given ASPSP. An inability, or practical limit, to keeping pace with a multitude of PSD2 standards would therefore limit the network effects of PISP services.

### Platform approach summary

To summarise, network effects for TPP PSD2 services are limited by the jurisdiction in which the TPP chooses to operate. Pan-European reach is made possible, in principle, by PSD2. Global reach is also theoretically possible, should a TPP succeed in achieving authorisations in multiple jurisdictions outside the EEA. In practice, however, AISP services are logically determined by specific, local market factors, resulting only in country-specific reach being relevant, irrespective of regulatory scope or through multiple authorisations across jurisdictions.

For PISP services, PSD2 has, in theory, enabled pan-European reach, but this may in practice be limited by a TPP's willingness to implement solutions for the many PSD2 standards that are emerging.

## OPEN BANKING ARCHITECTURE CONSIDERATIONS

The factors that influence the IT architectures of open banking platforms are now explored.

### Open banking usage profile

The difference in usage profiles between open banking and traditional banking are first considered.

In general, traditional banking is subject to highly predictable loads based on:

- a known customer base for a given ASPSP;
- online usage patterns that are well understood and predictable; and
- system processing that is based on periodic cycles (eg daily processing cycles such as overnight batch processing, and monthly processing cycles, such as billing).

It is reasonable to suppose that net transaction volumes will increase substantially as TPPs develop their propositions and these gain maturity in the marketplace. This alone will result in customers interacting with their bank more frequently, albeit indirectly via the TPPs applications in 'customer present' scenarios. Furthermore, there will be an increase in transaction volume driven from the TPPs directly. TPPs, having obtained consent from the customer for specific account information, will exercise their right under PSD2 to access that information up to four times daily in 'customer not present' scenarios.

However, with open banking, transactional loads are likely to be significantly less predictable. The open banking transaction volumes have a more complex and less deterministic relationship with existing customer volumes and their access patterns:

- PSUs may employ the services of several TPPs and thus a multiplier will apply to the volume of transactions normally associated with a given customer base. This multiplier is currently difficult to quantify as:
  - the percentage of account holders that subscribe to use PSD2 services is not yet known; and
  - the number of PSD2 services that PSUs subscribe to is likely to be highly variable.
- TPPs will undoubtedly access account information and transaction history without the PSU being present up to the limit defined by the regulation, this being up to four times per day in the case of PSD2.

- Information access patterns are less predictable and determined by the AISP's schedule rather than known PSU access patterns that are within the ASPSP's control.

These characteristics translate to specific IT issues for the ASPSP, notably:

- how to achieve scalability of the mandated services to meet a, potentially huge, increase in transactions volume;
- how to accommodate peak loads at non predictable times; and
- how to ensure the performance and availability of the regulatory interface to support the PSD2 services.

## The scalability challenge

Consider now the typical ASPSP IT architecture that supports traditional banking. The underlying customer account information and transaction history will typically reside in a core banking platform. These fall into two categories:

- a bespoke legacy system, developed over many years, which is difficult to maintain and has rigid release cycles for enhancements; and
- a vendor product solution, providing a complete or modular banking solution.

Both of these implementations present challenges in meeting the non-functional characteristics of open banking outlined. Specifically, the ability to scale cost-effectively becomes difficult. Both legacy mainframe and vendor products pricing are very dependent on supporting hardware and the number of CPUs required. For this reason, cost breaks relating to hardware and vendor product licensing tend to be highly non-linear. To accommodate open banking patterns via a traditional architecture means over-compensating to allow for sufficient headroom in the capacity. Thus, mitigating the scalability risk in this traditional manner is likely to be highly cost-inefficient given the wide range of loads that could be experienced.

The ability to scale on demand and at a cost that is linear to the transaction load is highly advantageous for open banking solutions.

## The paradigm shift challenge

Data in core banking systems can be stored in a variety of specific formats:

- in the case of legacy systems this may be a mainframe file datastore;
- in more modern implementations and vendor package solutions this is more likely to be a relational database.

The standards emerging for open banking regulatory services prescribe the use RESTful APIs for their implementation. (REST is the generally preferred API technology of choice as it is based on open standards and the use of a 'lightweight' stateless HTTP protocol for its requests and responses.) This entails the use of Java Script Object Notation (JSON) for the data payloads. (Compared with other API protocols, such as SOAP/XML, JSON requires less bandwidth, making it more suitable for internet usage). On this basis, should account information data be retrieved from the core banking platform, a translation from core banking system data format to API data format must take place to meet the API standard.

This problem may be compounded by previous efforts within the ASPSP to implement other architectural paradigms, such as service-oriented architecture (SOAP), which is based on an entirely different technology stack and protocols to API implementations. This could lead to a sequence of data translations and gives rise to significant performance challenges and risk as there may be multiple data format transformations all the way through the technology stack

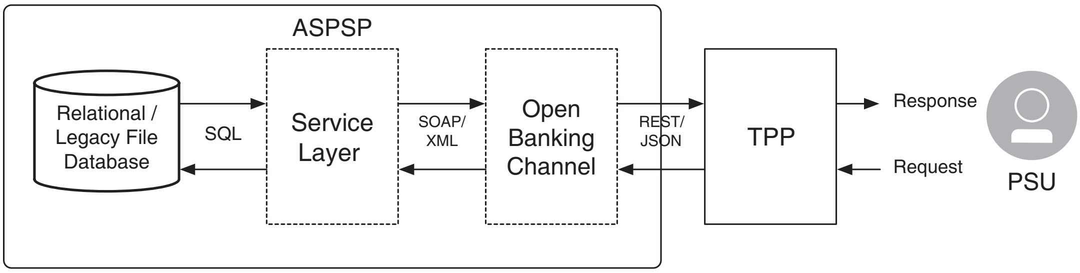


*Figure 4: Data paradigm shifts from ASPSP to TPP*

from data storage through to API payload. This is illustrated in Figure 4.

To achieve a performant open architecture to support open banking it is desirable to avoid the potential paradigm shifts in data representation as the data move from core banking system to transmission via an API and finally to the FinTech application.

## Supply-side considerations

As discussed, the transactional characteristics of open banking suggest a net increase in volumes transactions. To reduce the number of direct read-only transactions on the core banking systems, one approach is to duplicate data from the core banking systems to support the account information and transaction history requests. External services consumed by the TPPs therefore transact on this 'cache' of the core banking system data. No-read transactions that touch the ASPSP's core banking platform are therefore necessary to support the open banking information requests. This is considered key to the ability to scale cost-effectively as scaling cost is now decoupled from core banking scaling cost.

The required data flow for account data between the ASPSP and AISP is shown in Figure 5.

Additionally, by using a cached data store that stores data in a similar format (JSON) as employed in the transmission via the APIs, there is limited computational effort in responding to an open banking information request. This further enhances scalability and reduces the risk relating to slow response times.

Supporting payment initiation, which is a 'create' transaction, requires integration with other key back-end banking platforms, specifically the ASPSP's payment engines or payments hub. In this respect, a real-time integration with back-end banking systems cannot be avoided and the caching pattern adds no benefit.

## The case for cloud platforms

Given the architectural challenges highlighted for open banking, the case for cloud service implementation of open banking platform is now highlighted. The beneficial features of a cloud service include:

- *Elastic scaling:* As transaction volumes increase or decrease, cloud autoscaling technologies can scale the computing resource automatically as required.
- *Use of lightweight protocols:* The use of REST APIs and JSON for data specification requires less computing resource in the supporting middleware versus other paradigms such as service-oriented architecture that are based on 'heavyweight' protocols such as SOAP and XML. This reduces computing resource requirements and makes the solution inherently more scalable.
- *'No SQL' database technology:* 'Document' style storage databases allow data to be stored the in the same format as originally transmitted, including JSON. This requires

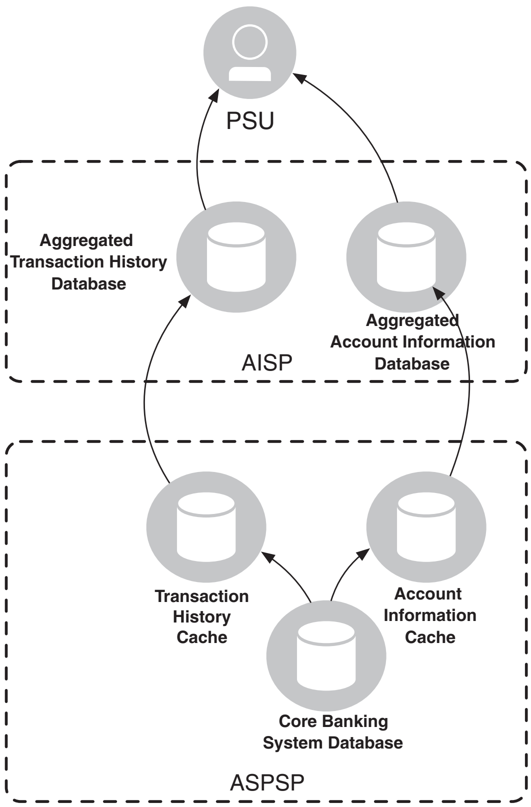


*Figure 5: Optimised data flow pattern from an ASPSP to an AISP*

no, or minimal, format translation from data store through to payload.

- *Use of open source middleware:* Open source software is prevalent for cloud deployments. Licensing models are much more scalable as the software is free or at least better geared to the highly elastic solutions enabled by the cloud. This makes open banking solutions using cloud deployments linearly scalable and more cost-effective.

## OPEN BANKING PLATFORM TYPES

Several types of open banking platform are now identified and their features and merits discussed.

### Open banking as a service

A supply-side platform provides the open payment services for achieving PSD2 compliance on behalf of an ASPSP, hence the broad term 'open banking as a service' (OBaaS).

In the platform concept presented, all open banking interfaces, whether to meet regulatory requirements or the ASPSP's own competitive market initiatives, are offered via the platform. The key to the success of this approach relates to the effectiveness of the integration between the ASPSPs and the cloud. This integration will typically employ the bank's existing middleware technologies and interfaces.

It is useful to present this platform in the context of the PSD2 requirement for strong customer authentication (SCA). SCA, in simple terms, comprises the approach to authenticate a PSU using two factors to reduce the possibility of impersonation attacks. In practice, this step also includes attaining the consent of the PSU to permit the TPP access to their payment account.

One of the SCA methods that ASPSPs can choose to support is 'redirection', whereby the user is redirected from the TPP application to the ASPSP such that actual authentication takes place within the ASPSP's application, such as their existing online banking application. In this respect, the OBaaS platform is designed to be a 'headless' service (ie one without any user interface). Consequently, a further integration is identified to support this SCA style. Figure 6 shows the overall context of a supply-side open banking platform and the high-level IT connections required between system components.

As discussed previously, to leverage the advantages of a cloud platform and achieve the necessary cost-effective scaling for an open banking solution, customer account data and transaction history are replicated to the platform. The consequence of this replication is that:

- enquiry-only transactions associated with account information and transaction history

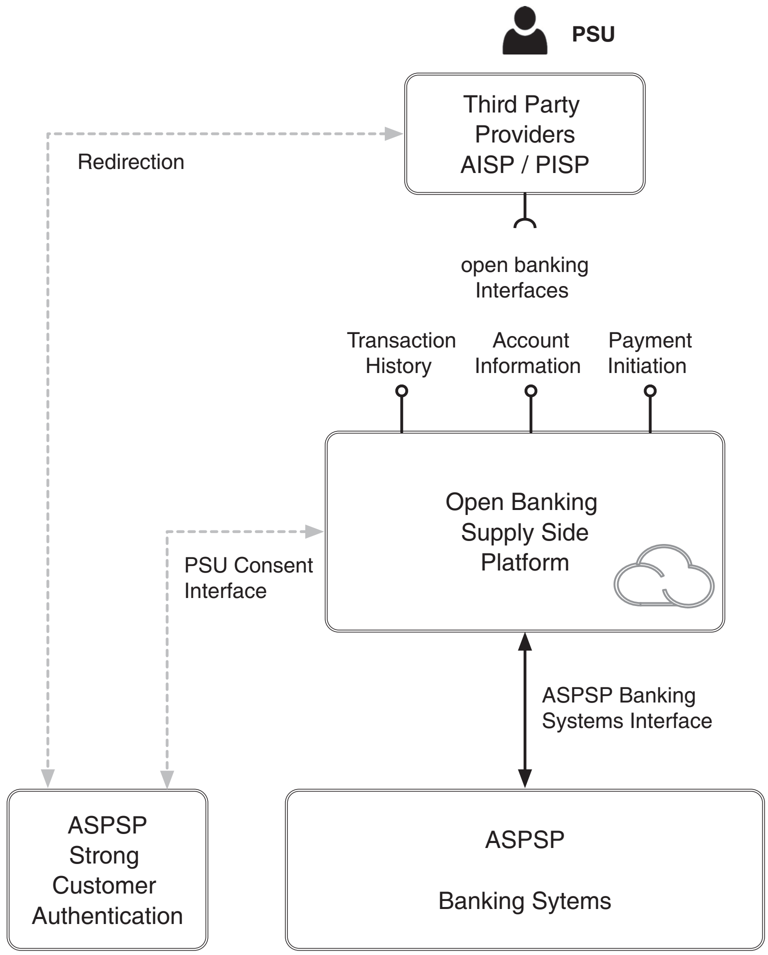


*Figure 6: Systems context of a supply-side platform*

requests are supported from the data caches in the cloud; and
- the ASPSP must update the data caches within the cloud from account data from the core banking platforms.

To support the latter data replication, the concept of a 'hydration engine' is introduced. This component is responsible for:

- integrating with the core banking systems to extract data relating to transactions on customer accounts;
- marshalling and streaming such data to the cloud platform; and
- receiving the data streamed to the platform and updating the account information and transaction data caches.

In this respect, this particular component implementation spans both the environment of the ASPSP and that of the platform.

### *Components*

The application components for the OBaaS platform are illustrated in Figure 7 and are described below:

- *API gateway:* This component hosts the API endpoints that TPPs will utilise to access

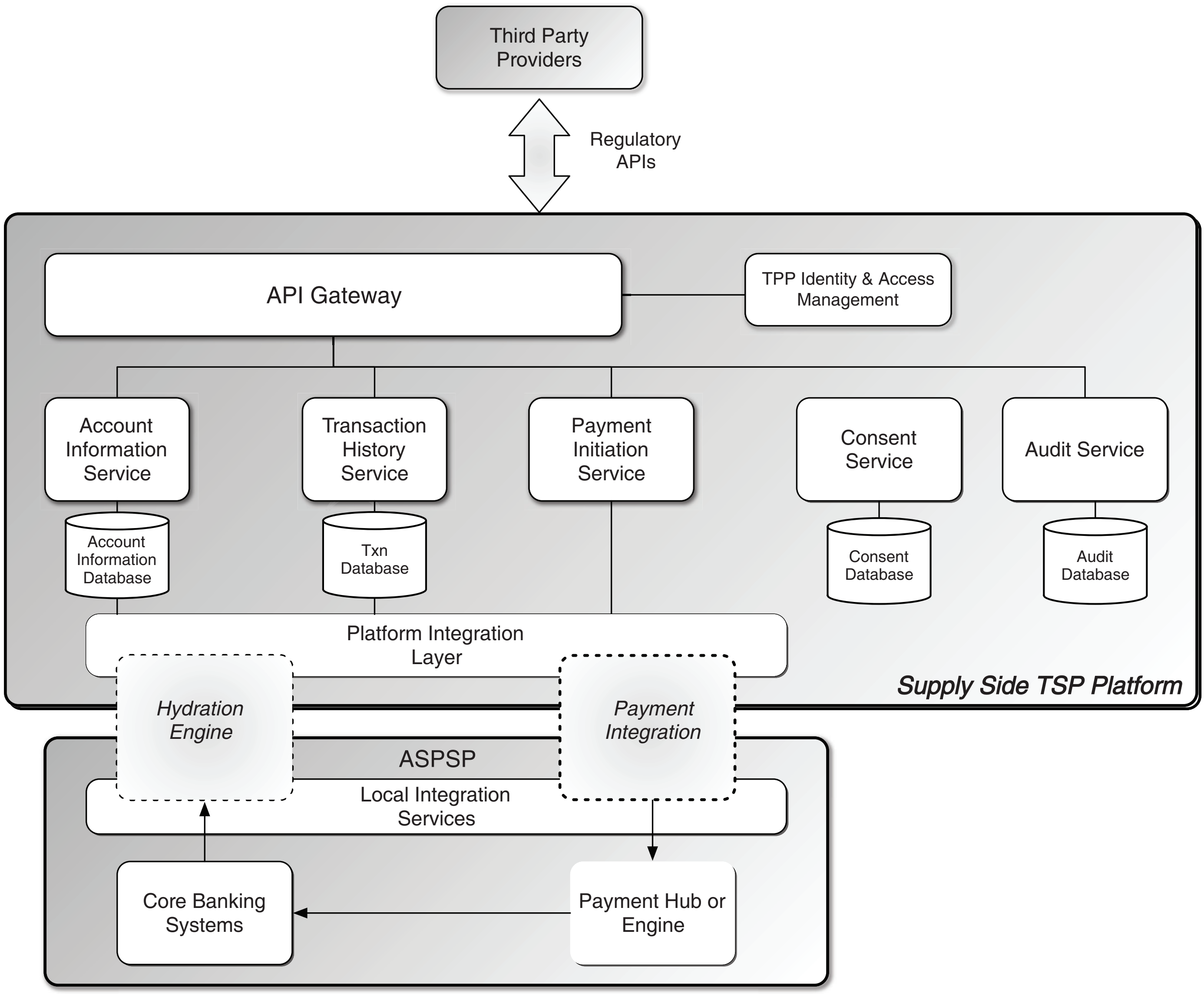


*Figure 7: High-level architecture for the OBaaS platform*

the payment account services and payment initiation capabilities. PSD2 mandates that the identity of a TPP must be proven with a digital certificate and that the TPP is an entity that is regulated. It provides services to ensure the appropriate consumption of APIs only by regulated TPPs and supports the necessary application protocols employed by the open banking services, notably TLS 2.0.

- *TPP identity and access management:* This component provides TPP authentication and authorisation services. It supports the necessary authorisation and identity protocols employed in the ecosystem, such as OATH2, and manages the identities of TPPs registered with a particular ASPSP.
- *Account information service:* This component provides the business logic to process the information requests and retrieve data

stores and the data stores containing the replicated account information.

- *Transaction history service:* This component provides the business logic to process the transaction history requests and retrieve data and the data stores containing the replicated account information.
- *Payment initiation service:* This component provides the capabilities to implement the payment initiation APIs. These may include message format and business validation.
- *Platform integration layer:* This component provides the integration services in the cloud to support the hydration engine's updates to the cloud data stores. It also provides real-time integration services to local ASPSP components and services that are needed to provide payment initiation services to the TPPs
- *Local integration services:* This component provides integration services that are local to the ASPSP that support the hydration engine functionality. Specifically, this relates to the integration with the ASPSP's core banking systems. Depending on the scope of accounts types offered by the ASPSP, there are likely to be a number of different integrations to a variety of core banking platforms, typically for retail, business banking and credit card platforms.
- *Consent service:* This component creates tokenised data structures that encapsulate the consent given by a PSU to TPP to access their account data and stores this in the consent database. The consent token is then retained by the TPP and presented when it attempts to access account data of the PSU. When a TPP requests account data, the service checks the validity of the consent token presented against to the associated stored consent for that PSU and TPP. If it successfully matches, the TPP is allowed to access the account data.
- *Audit service:* Provides a business log of the transactions that have taken place via the platform. Used to support PSU enquiries and disputes.

## AISP platform

Figure 8 shows the application components of an AISP platform. This platform is a demand-side platform that provides the services necessary for an AISP to utilise open banking regulatory APIs.

The characteristics of this platform are the accumulation of large amounts of transaction data. The data feed:

- a simple transaction query service to support the view of transaction by the PSU;
- AISP-specific services such as money management services as per the specific business model; and
- an analytics capability that is used to provide customer insights for the PSU directly or to inform the development of further innovative services by the AISP.

The technical challenges for this platform are the scalability required to support the Big Data solution around the transaction history data. Cloud technologies, as discussed, will add significant benefit and are the *de facto* choice for the implementation technologies.

## PISP platform

This platform is a demand-side platform that performs the payment initiation services of a PISP.

Figure 9 illustrates the components of the PISP platform and these are described below:

- *payment initiation service:* This component performs the functions necessary for submitting a payment initiation request to an ASPSP;
- *consent service:* provides consent capability from the TPPs perspective, storing the generated consent token for presentation to the ASPSP when submitting a payment initiation request;
- *audit service:* as per the supply-side platform described previously; and

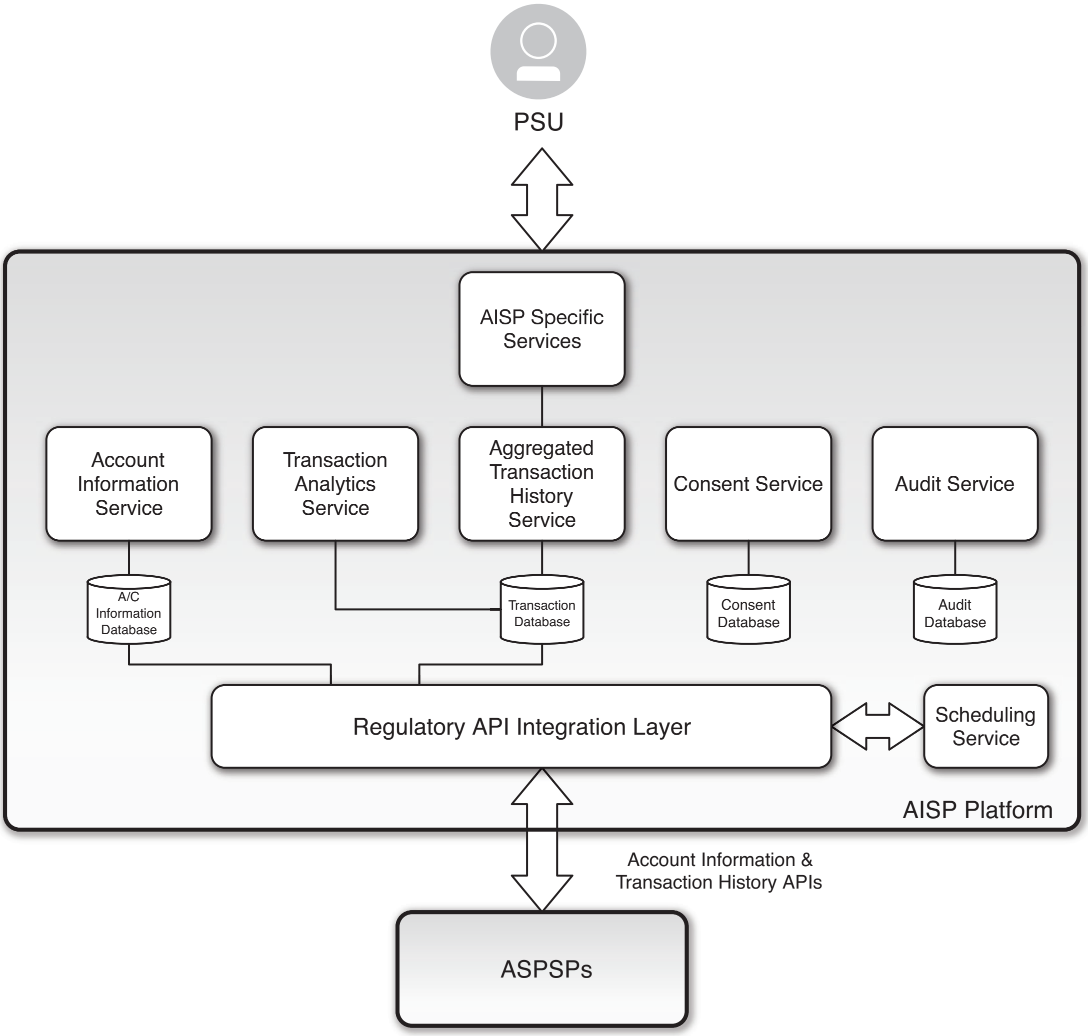


*Figure 8: AISP platform components*

- *regulatory API integration layer:* this component manages the technical interactions with the ASPSP regulatory APIs — this includes the technical protocols for authorisation of the TPP and the secure transmission of data via the APIs.

The key services of this platform are that it provides a stateless transaction capability to create a payment order. Unlike an AISP platform, it does not accumulate significant amounts of data. In this respect, while a cloud implementation may still offer benefits, it is not as critical to the implementation as it is for an AISP or ASPSP platform as the data-scaling requirements are significantly less. However, should PISP transaction volumes become significant in the long term, the elastic scaling properties of the cloud are ideally suited to scaling the payment initiating service.

## Demand side technical service provider platform

Figure 10 illustrates the components of the demand-side TSP platform. This platform

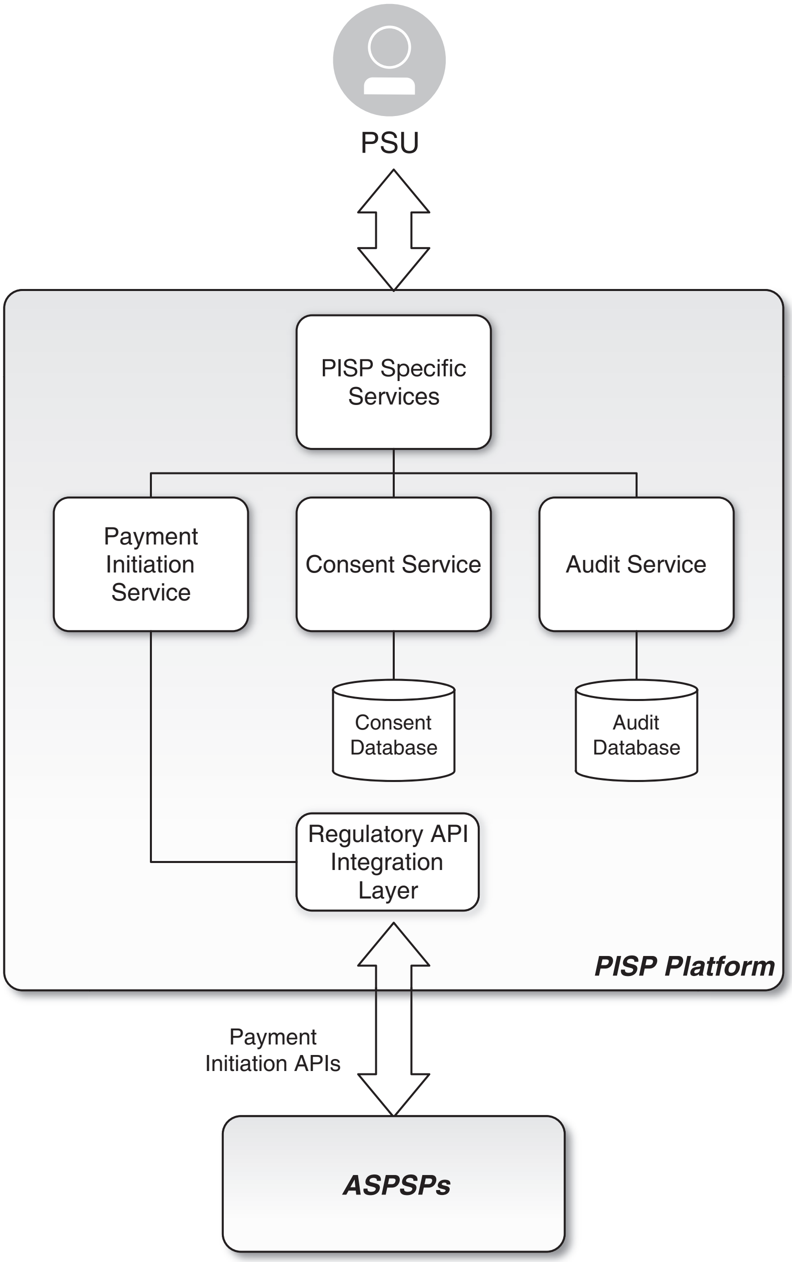


*Figure 9: PISP platform components*

supports both AISPs and PISPs. The core open banking services to support each of these actors are provided by the platform. By offering these services as a platform, TPPs are then free to focus on the development of their customer propositions. The components are an amalgam of those required for the AISP and PISP platforms. Instead of interfacing directly with the ASPSP's regulatory APIs, TPPs interface with proprietary APIs offered by the platform.

From a TPP perspective, this offers a number of potential advantages:

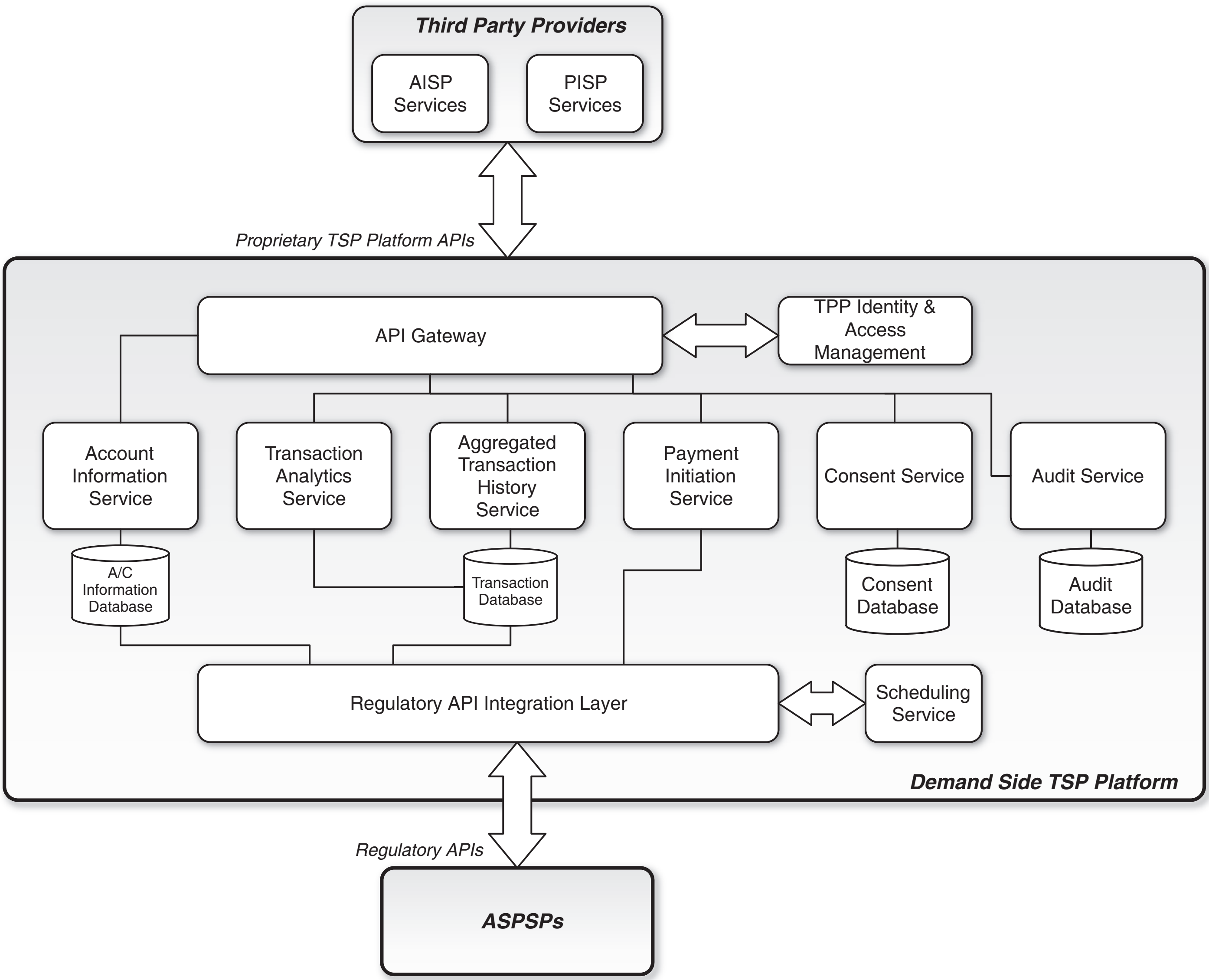


*Figure 10: Demand-side TSP platform components*

- simpler IT solution interfacing via one set of platform APIs rather than multiple open banking standards;
- robustness to changes in the regulatory APIs as changes to minutiae of the regulatory APIs may not impact the platform APIs;
- lower IT operating costs, as the platform can provide these services on a lower cost basis due to economies of scale and scope;
- lowers barriers of entry for a TPP as they are not faced with significant development costs to design and build multiple complex regulatory API interfaces.

## Multi-party open banking platform

It has been previously been highlighted[5] that PSD2 is merely a trigger for a much broader open banking initiative and that,

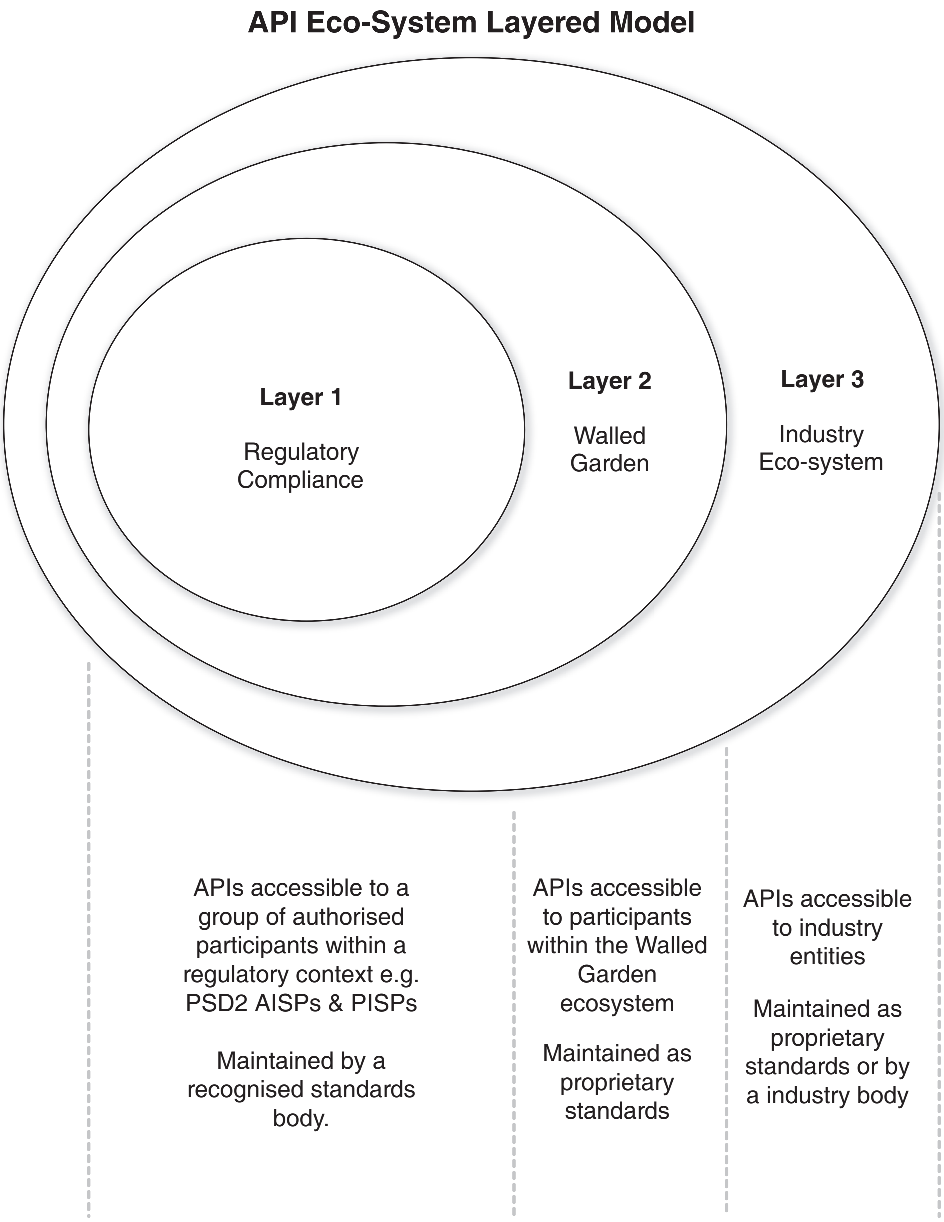


*Figure 11: Layered ecosystem model*

due to limitations of PSD2 applying only to payment accounts, an extended API eco-system is likely to develop. This extended ecosystem consists of multiple layers of APIs that provide additional services over and above the regulatory minimum as illustrated in Figure 11. In these circumstances, the interaction between the market participants becomes more varied and complex.

To support these wider interactions, the concept of the multi-party open banking platform is proposed. Figure 12 shows the interactions of the ecosystem participants and the proposed multi-party open banking platform.

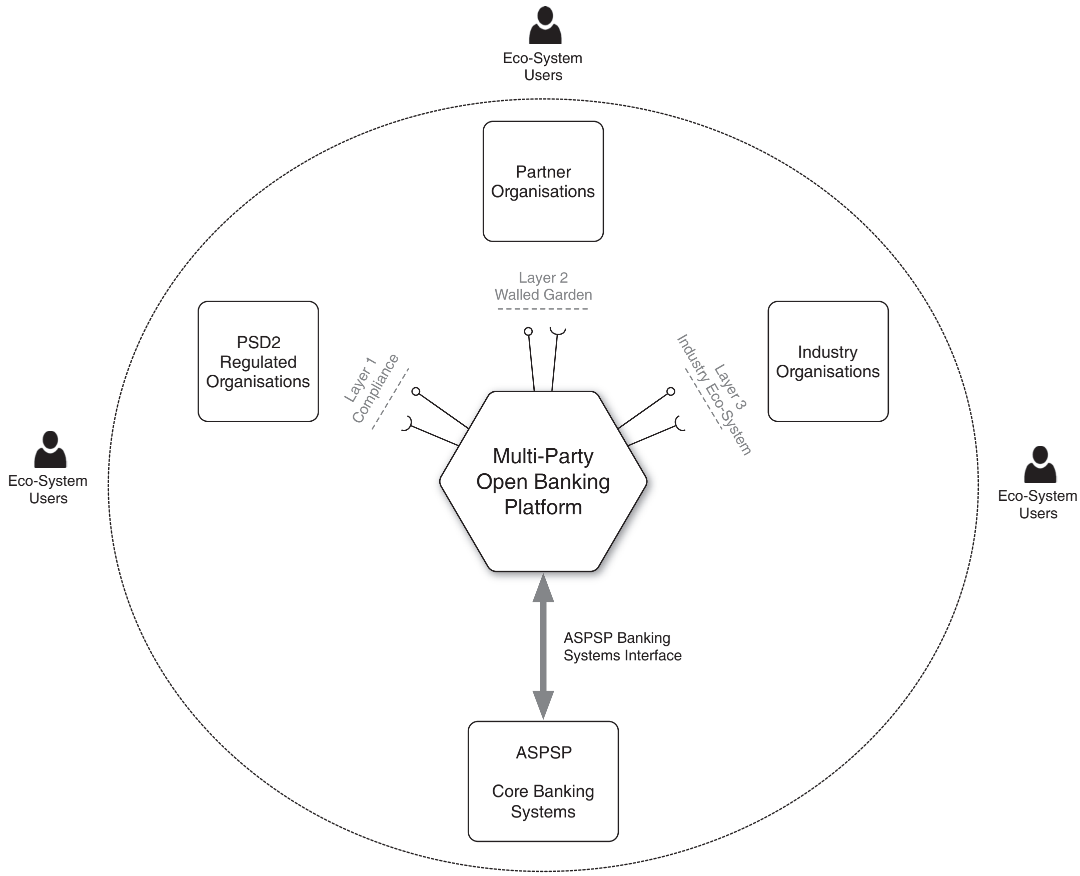


*Figure 12: Multi-party open banking platform concept*

The key features of the multi-party open banking platform are that:

- It supports both the supply and demand-side perspectives:
  - supply-side perspectives are driven by regulation, enforcing the market participants to provide specific services;
  - demand-side perspectives are driven by the consumer and by what a participant wants to provide, or is capable of providing, to them.
- Customer data are the key asset of the platform:
  - the platform contains the customer financial data upon which the propositions are built;
  - data analytics forms the basis upon which the consumer (demand) propositions are constructed.
- It provides support for all identified layers of the open banking ecosystem:
  - the platform provides the necessary infrastructure and collaboration frameworks for participants to collaborate, notably identity management and the constructs needed to transact securely.
- The interfaces use RESTful APIs for all collaborations between participants.

In terms of its IT architecture, the platform is an amalgam of the components of the demand and supply-side technical service provider platforms.

## Rationale for multi-party platform

### *Economies of scope*

The avoidance of having to create dedicated solutions for each implementation of the API layer or to implement point-to-point solutions between business partners provides a number of opportunities for economies of scope, including:

- reduction in infrastructure costs through a single highly scalable operational platform;
- the consolidation of the technology types employed and a reduction in physical deployments reduces overall costs; and
- opportunities to reuse services from the different API layers in different business contexts, again providing the opportunity to reduce costs.

### *Common security framework*

A common security framework comprised of agreed security standards and protocols can be provided. Similarly, there is the opportunity for a common trust framework between all parties. However, the latter may be more of a challenge as PSD2 regulation demands a specific trust framework as defined by the Regulatory Technical Standards[6] (RTS). This particular feature of the RTS is not considered to be suitable for generalisation and therefore for use within the non-regulatory layers, although some of the inherent principles could be adopted.

### *Consistent identity and access management*

Given the potential number of TPPs collaborating within the ecosystem and its inherent layering of the APIs, this creates challenges with respect to:

- how to control the access to APIs within the layers of the ecosystem;
- managing the volume of the TPPs as more propositions come to market;
- achieving interoperability relating to the identity of TPPs, their role and how to control access.

In this context, the discipline of identity and access management becomes extremely important. The multi-party platform can offer a core capability to manage identities of the participants and provide the necessary authentication and authorisation services. The application of role-based access in the platform can be achieved through a configurable centralised policy management and enforcement capability, simplifying the management of TPP identities and their access rights.

### *Summary*

In a future, wider, open banking API ecosystem, with services over and above the baseline regulatory capabilities, the concept of a multi-party open banking platform provides an elegant solution that can provide unified security standards and trust models. It would also manage the identities and control the access of all ecosystem participants in a consistent manner, achieving economies of scale and scope.

## CONCLUSION

Open banking appears well suited to its implementation through a variety of platforms. Two categories of platform have been identified, namely the supply side and the demand side. Platform theory in the form of the virtuous cycle model has been applied to the AISP supply-side platform. The model suggests that the key network effect dimension is that of the account data; the more data accumulate and the greater the scope of the data, the more this will generate innovation, enticing more customers, in turn generating more account data. In terms of qualifying the future success of open banking, this cycle is considered important as any platform will ultimately be judged by the value it creates for its users.

The network effects of open banking platforms have been shown, in principle, to have a limitation on reach, bounded by the regulatory jurisdiction and the domicile of the PSU. At this stage in the maturity of open banking, it is unclear whether network effects are sufficient to reach a tipping point for its wide adoption. A widening of the scope of the regulation in terms of account types may help in this respect. Further, given the identified limitations on reach, the emergence of truly global open banking platforms seems unlikely.

From an IT perspective, open banking has been shown to have distinctly different usage characteristics to traditional banking. This leads to specific non-functional characteristics in terms of unpredictable loads that may have significant multipliers relative to the underlying customer base and new patterns of access to payment accounts.

In terms of the implementation of the variety of platforms, cloud technologies have been highlighted as being well suited to meeting the transactional characteristics of open banking. It is expected that such cloud platforms will become the *de facto* standard for the implementation of open banking solutions.

Finally, a number of B2B technical service provider platforms have also been identified. As B2B models, these do not adhere the virtuous cycle identified for the business-to-consumer models of AISP and PISP platforms. Network effects are not considered to be critical in their adoption and uptake. However, there are numerous distinct advantages in their usage for ASPSP and TPPs, their uptake being premised on:

- a reduction in IT complexity for open banking participants;
- reduced barriers to entry for TPPs; and
- reduced IT operating costs due to the economies of scale and scope of the platform provider.

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