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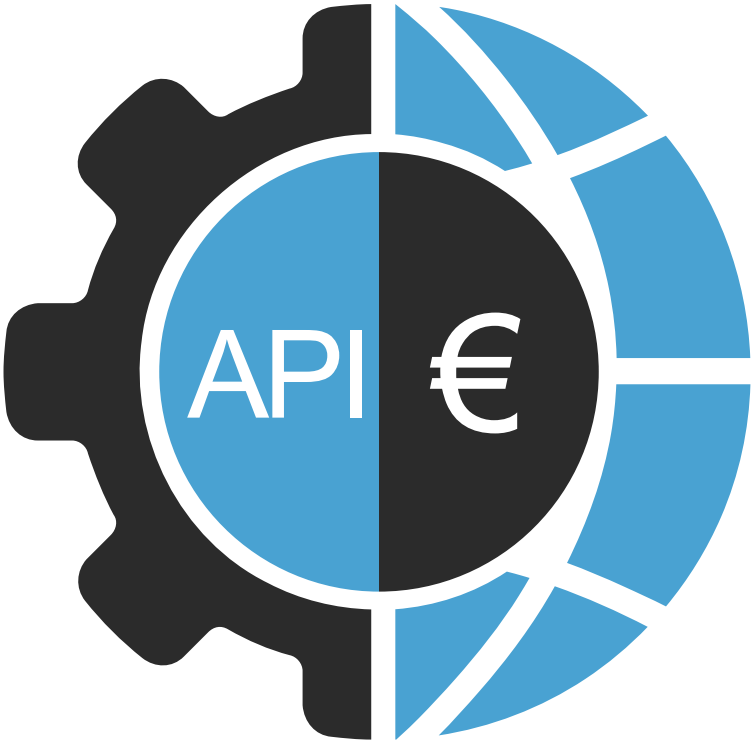
EURO BANKING ASSOCIATION



Understanding the business relevance of Open APIs and Open Banking for banks

Information Paper

EBA Working Group on Electronic Alternative Payments

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The information paper is the result of an analysis carried out by the EBA Working Group on Electronic Alternative Payments and Innopay.

FIGURES AND PICTURES

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1. EXECUTIVE SUMMARY

Since 2015, Open APIs (Application Programming Interfaces) and Open Banking have gained traction and have grown from being purely technical topics to being of business relevance for banking practitioners. Outside of the banking industry, companies with a digital focus (e.g. Google, Apple, Facebook, Amazon, Salesforce, and Twitter) could not have grown so fast in the past decade without the business accelerating capabilities of APIs. Opening up towards other market participants outside of one's own organisation has proven to create value for customers and to benefit the surrounding ecosystem.

Today's fintech movement and the revised Payment Services Directive (PSD2) provisions for access-to-account have accelerated the competition and digital disruption that are remodelling the financial services industry. Consequently, the financial services industry's interest in Open APIs and Open Banking is gaining momentum and is not limited to payments.

This information paper explains the most relevant concepts and offers some strategic insights for bank business leaders, with regard to the business relevance of APIs. The key observation of this information paper is that Open APIs and Open Banking could change the way banks think about products and distribution, two key dimensions in every business. APIs and digitisation in general allow value to be created in a distributed fashion, through an ecosystem of partners. Co-creating value is likely to prove to be a major change and challenge for banks in the near future.

However, banks may benefit from Open APIs and Open Banking as this could pave the way to enhanced innovation and customer relevance, industrial partnerships with the larger ecosystem of Fintech market participants, and, last but not least, compliance with the upcoming PSD2 regulation. On the downside, there is the risk of disintermediation, next to general reputation and compliance risks. New collaboration and revenue models could push banks back in the value chain leading to their contributing a smaller or less profitable portion of it.

For bank practitioners, essential decisions lie ahead. By the end of 2018, a minimum step towards more openness is mandated by the PSD2 provisions. More challenging decisions remain, however, when it comes to the overall strategic positioning of the bank and the ability to utilise the ecosystem in co-creating value.

2. INTRODUCTION

2.1. Services on top of the infrastructure layer

The EBA's activity stream on electronic alternative payments focuses on payment innovation taking place in the consumer and retail e-commerce space and the implications/challenges of the changes this innovation entails. A dedicated working group was set up in 2013 to help the EBA membership gain a deeper understanding of the changing structure of retail payments and the impact of electronic alternative (e-AP) payment products on traditional cash, cards and ACH payments.

Through its research, the EBA has been supporting members in identifying user requirements with regard to next generation alternative payments. One focal point of the work of the EBA in this area consists in investigating how these requirements could be met by an evolved retail infrastructure and assessing the potential space for collective pan-European approaches in this field.

In 2014 and 2015, the EBA produced a number of opinion and information papers on electronic alternative payments:

During the second half of 2014, the e-APWG started describing the implications of these developments for payment infrastructures. In May 2015 two papers on "Exploring the Digital Customer Services Interface" (DCSI) and the topic of cryptotechnology followed.

In these papers the e-APWG elaborated its vision of the interbank payment infrastructure as a fundamental pillar of a burgeoning fintech-driven 'services layer' that emerged on top of it.

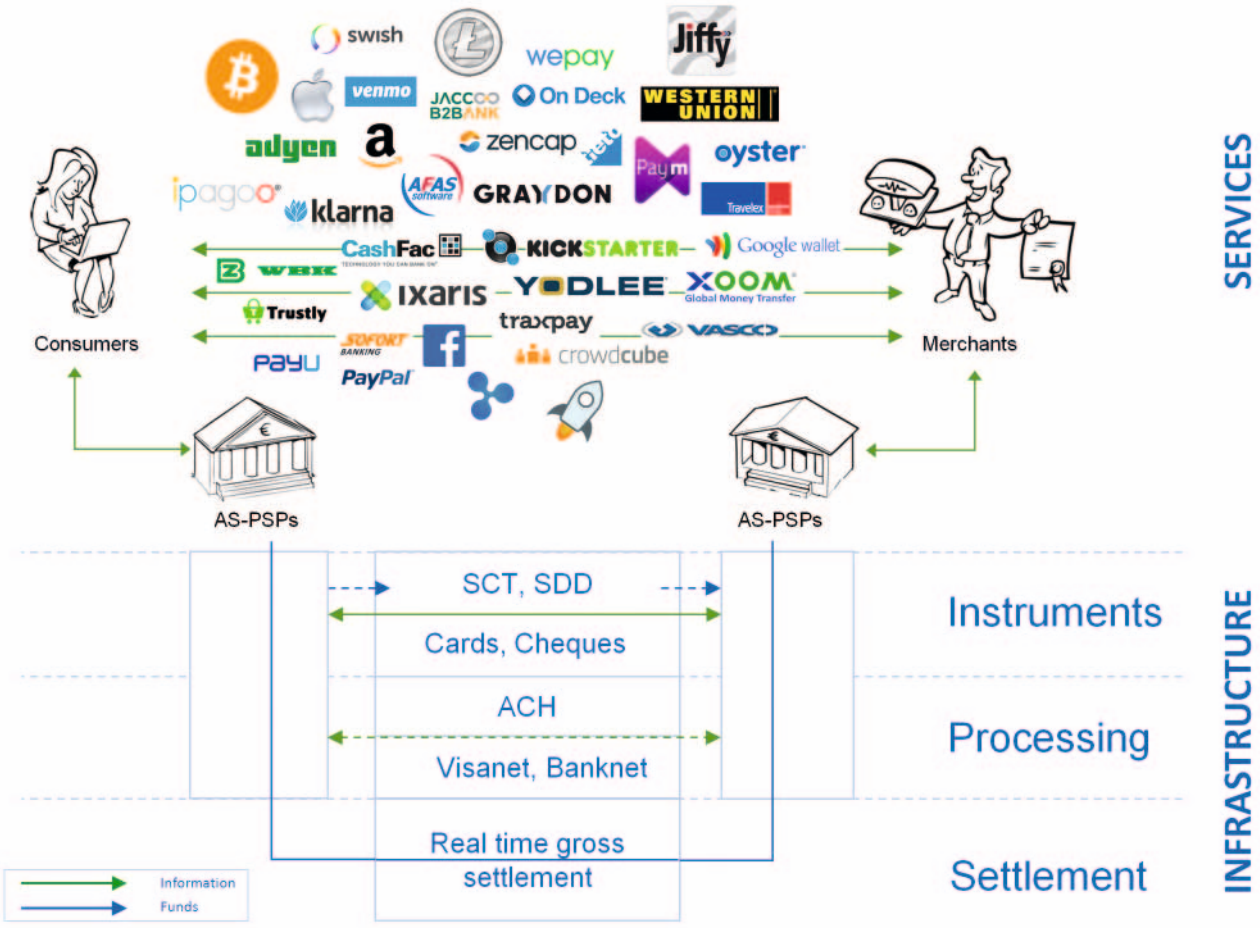

Figure 1: *The services ('fintech') layer on top of the infrastructure*

The existing payment infrastructures for SEPA and cards offer end-to-end trusted reach. The services layer is building on the advances in technology and ongoing digitalisation. It facilitates (real-time) information exchange on funds transfers taking place in the infrastructure layer. Therefore, the services layer is mainly relevant for conversion, i.e. it allows the offering of attractive functionalities for (e-)commerce.

The e-APWG has identified a mismatch between reach and conversion for payers and payees: consumers, businesses and/or public sector organisations. Improved interfaces between infrastructure and service layers, i.e. between banks and fintechs, could accelerate innovation benefitting end customers, extend the reach of banks in innovative services and grow the market further. In this regard, APIs can help banks to close the 'customer convenience gap' by enabling innovation in banking services, both own or third-party services.

2.2. Trend: interfacing between market participants through APIs

The growing interest in API technologies and Open Banking may be seen in the light of a need to resolve the mismatch between reach and conversion, i.e. a lack of a connection between the services and the SEPA infrastructure layers. Digital companies (e.g. Amazon, Google, Salesforce, Twitter, Facebook and Apple) and also increasingly banks, seek to connect with innovative firms outside of their organisation to deliver attractive services to their customers, when and where the customer needs them. In the past decade digital companies outside of the financial industry have proven this strategy to be successful. Many traditional business models across a variety of industries have already experienced dramatic and positive change driven by APIs.

This information paper aims to describe the current trend of 'opening up' for banks against the backdrop of accelerating change in the areas of regulation, technology, competition and customer behaviour. This paper also introduces an analytical framework which allows business leaders to structure and analyse strategic choices associated with Open APIs and Open Banking. The paper was created as a collective effort of the e-APWG members, direct interviews with national communities and desk research.

2.3. Reading guide

Chapter 3 describes Open APIs and how they can create value for businesses and their customers. Examples from the non-financial sector are also included. Chapter 4 elaborates what this could mean for individual banks and chapter 5 discusses the current situation of banks regarding Open API and Open Banking. Key observations are summarised in chapter 6.

3. RELEVANT CONCEPTS IN APIs

APIs can be seen as interfaces between software applications, both within as well as between organisations. More specifically: APIs enable communication between software applications where one application calls upon the functionality of another application.

Every API is an interface, but not every interface is an API. API is a specific software architectural approach that revolves around the view that interfaces should be **scalable**, **reusable** and **secure** while offering ease of use for developers through **self-service**. APIs therefore hold the promise to reduce cost and lead time of interfacing between systems, allowing for faster, cheaper and better innovation on a larger scale.

This chapter analyses various business dimensions of APIs relevant for business leaders, starting with the concept of 'openness' in relation to APIs.

APIs: key technical concepts

In their simplest form, APIs are standardised sets of requirements that govern how one software application can talk to another. These requirements aim to safeguard quality aspects and increase ease of use of these interfaces. Communities or individual parties, who often provide these standards as open source, have developed many of today's API technical standards.

As a result of this evolutionary standardisation nowadays API technical standards typically consist of:

1. ***Data Transmission**: the way the data is transmitted securely. Almost all APIs use HTTP/HTTPS as a transport layer because it is simple and widely compatible, although there are APIs which can be used over a wider variety of transport protocols.*

2. ***Data Exchange**: the format of the exchanged data. The most common formats are XML and JSON. While XML has slightly more functionality than JSON, the latter is winning in popularity. JSON can be used for most purposes and is less detailed, thus allows for faster exchange and is considered better machine-readable. Some companies offer their APIs in both formats, whilst others only have one format available.*

3. ***Data Access**: access management (who gets access to which data and how is this achieved). There are multiple standards for this, popular ones are SAML and OAuth 2.0. The first is an XML-based framework and is widely used in business-to-business interfacing. OAuth is a framework that originated in the consumer web services world.*

4. ***API Design**: the way APIs are designed. Common standardised design principles for APIs are REST (**Re**presentational **S**tate **T**ransfer) and SOAP (**S**imple **O**bject **A**ccess **P**rotocol). REST is currently more popular due to its focus on solving issues related to performance, scalability, modifiability, portability, and reliability. Although SOAP is still popular in enterprise environments, it is considered more complex to implement.*

Most APIs, whether they are open or closed, are built along these open global technical standards.

3.1. The level of API openness determines potential reach

APIs enable secure, controlled and cost-effective access to data and/or functionality, potentially by third parties. If APIs can only be accessed within the boundaries of one organisation, they are referred to as 'Closed APIs' or 'Private APIs'. If they can also be accessed by third parties (outside of the organisational boundaries), they are referred to as 'Open APIs'. Open APIs are the focus of this information paper. 'Open' does not mean that every third party can access a bank's system at their discretion. There will always be some form of control by the bank, in order to preserve security, privacy and contractual conditions. This will be further detailed in chapter 3.4.

In practice, different levels of API openness can be observed. This is important because the level of API openness determines the potential number of parties with access and thus the potential reach of the functionality offered through the API. In this information paper the following levels of 'API openness' are used:

1. **Private APIs**: Private APIs are closed APIs, and therefore exclusively accessible by parties within the boundaries of the organisation. By definition these are **not** considered 'Open APIs' in this information paper.

2. **Partner APIs:** APIs that are open to selected partners based on bilateral agreements. Like Private APIs, Partner APIs are exclusively accessible at the discretion of the provider of the APIs. Bilateral agreements on specific data exchanges between for instance a bank and an enterprise resource planning (ERP) software provider is an example of a Partner API.

3. **Member APIs**: This type of API is open to everyone who is a formal member of a community with a well-defined set of membership rules. When becoming a member of such a community the API provider allows access to the community members who comply with community membership rules and regulations. Future PSD2-mandated Account Information and Payment Initiation Services fall in this category as only authorised or registered Third Party Providers (TPPs) can obtain access.

4. **Acquaintance APIs**: This type of Open APIs is inclusive, as they are open to everyone complying with a predefined set of requirements. Developer portals distribute this type of API, which also comes with some form of standardised agreements. Merchant access to point-of-sale (POS) APIs is an example in this category.

5. **Public APIs**: Public APIs are inclusive and can thus be accessed by anyone, typically with some form of registration for identification and authentication purposes.

The levels of API openness are depicted in the illustration below:

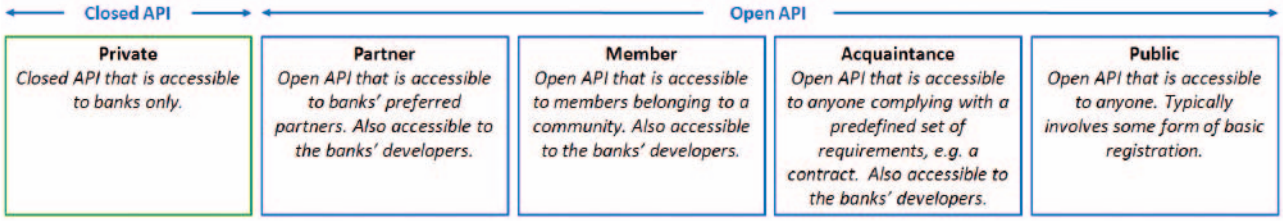

Figure 2: *Levels of API openness*

It should be noted that terminology surrounding APIs is still under development in the industry, and therefore not always consistently defined across publications of the recent past.

3.2. Creating value with Open APIs

Most digital market participants have used API technologies to meet their business objectives and ultimately create customer value. They have discovered that using APIs in opening up systems (to the outside world) is essential for driving traffic to one's assets, for co-creating end customer value in the ecosystem and for sharing the burden and benefits (including the profits) between the parties involved when unlocking new markets. Value co-creation through APIs can be categorised as follows:

- **Enabling third parties to build applications 'on top' of the platform**
  Examples include Facebook, Amazon, eBay, PayPal, Twitter, and Google. Developers can reuse existing functionality or use data sources to enrich their own applications. This lowers cost and speeds up time-to-market, but also creates additional dependencies on third party developers. For API providers, this way of value co-creation provides a wider distribution network, creating traffic and minimising innovation costs, which are carried by third parties.

- **Social sharing for marketing purposes**
  Examples include Flickr, Delicious, Twitter, YouTube, LinkedIn, and Facebook. Social sharing is about sending for example photos, videos, product recommendations and website links to contacts within a social network. Social sharing is highly effective for branding and marketing purposes and for generating web traffic. Banks could use social sharing principles to build user communities, retain or increase brand awareness and increase brand loyalty.

- **Syndicate products and services across different platforms**
  Examples include eBay and Google. Syndication occurs when multiple market participants work together to co-create and provide a service to a customer. Each market participant provides distinct features to create the value provided by the service. The fees paid by the customer are distributed amongst the syndicate membership.

The models described above not only enable and promote cooperation between different parties but also make it possible to create attractive and completely new value propositions. Ease of use, product and information aggregation and direct communication are key to catalyse this process.

The next chapter will show some examples of digital market participants who have successfully applied Open API strategies.

3.3. Examples of successful Open API strategies

Use cases from well-known digital market participants outside of the financial industry provide supporting evidence for the success of Open API-based strategies. Five (non-exhaustive) successful use cases of Open API usage by digital market participants from the past decade have been analysed and are summarised in Table 1. Appendix A contains more detailed descriptions of the analysis.

Table 1: *Companies that successfully apply API strategies (non-exhaustive)*

Company name	Rationale for using API
Salesforce	A novel approach to deliver their CRM proposition and make it easier for customers to integrate the Salesforce CRM into their existing workflows and to customise it
Twitter	Create a mutually beneficial relationship between third party developers to enable more functionality and convenience for consumers
Amazon	Extend their product offering to other digital platforms so customers can benefit from their large product offering
LinkedIn	Enable access to their large professional database to enable their customers to make better decisions with regard to human resources and professional networking
IBM Watson	A paradigm shift towards extending their machine learning and data processing platform to third parties, customers benefit from innovative use cases based on domain-specific knowledge of third parties

The above and many other use cases show how an organisation may benefit from using Open APIs. The number of APIs openly available to developers is constantly growing. The latest estimated number of Open APIs is 15.000 of which approximately 1200 are related to payments.[1] APIs have also been a mainstay component of 'platform strategies' of most of the organisations included in the table above. The next chapter examines APIs as a fundamental pillar for business strategy.

[1] See www.ProgrammableWeb.com for the latest figures

3.4. Financial APIs need agreements beyond technical aspects

In chapter 2.1 we have seen how APIs are usually built upon globally accepted technical standards. In the financial world, however, technical interfacing only is not enough for collaboration across organisations: where funds and sensitive data are involved, trust needs to be organised. An additional dimension is provided by the various ways in which data may be handled, this includes reading versus writing of data as well as different types of data. Personal customer data require different provisions than bank data or aggregated (anonymous) customer data. A higher level of control is therefore needed. However, banks already have experience with controlled third party access.

The financial industry has a long tradition of applying control and standardisation beyond technology, when creating infrastructures, e.g. for payments and securities, and when interfacing with clients and other third parties. We distinguish in total four agreement and standardisation dimensions (scope) in our industry:

1. **Legal:** Rights and obligations of concerned parties for creating trust among the parties involved;

2. **Operational:** The agreements needed for running an API (after implementation): performance, uptime, service levels, support etc.;

3. **Functional:** Aspects related to the user functionalities, data semantics etc.;

4. **Technical**: All technical aspects as described above in chapter 2.1.

Today's payment systems (and financial systems in general) cannot function without agreements on all of these dimensions, either by individual banks or by collectives. Therefore, financial APIs need at least a similar scope when it comes to agreements and standards. This is detailed further in the recommendations of the report of the UK Open Banking Working Group.[2]

3.5. Examples of Open APIs in the financial industry

The table below provides seven examples of the use of Open APIs in the European payments industry.

Table 2: *First movers with Open API in the payments industry (non-exhaustive)*

Organisation	Rationale for using API
PayPal	Extend their transactional services to other platforms to create reach. Achieved by developing a range of APIs with a customer-centric approach.
Crédit Agricole	APIs that provide authentication, credit and location-based functionalities amongst others. Improving engagement and customer relationship with its clients. Applications include social applications and games as well as an application that supports sight-impaired clients.
BBVA	APIs that enable authorised third party access to money transfer and other services on behalf of the client, profile and account data and aggregated card profiles. Applications include enabling intelligent consumer lifestyle choices such as timing of restaurant visits and recommendations as well as money transfer services.
VISA	The APIs are classified in four categories: Payment Methods, General Services, Risk and Fraud as well as Trial. They provide customers with a new e-commerce experience based on Visa technology. Example APIs include Visa Checkout.
MasterCard	MasterCard offers APIs that provide functionalities with regard to payment, security or location. This leads to an improved retail customer experience, with merchants benefitting from higher conversion rates through APIs such as the Masterpass In-APP Purchasing API.

[2] http://theodi.org/open-banking-standard

SWIFT	SWIFT Integration API (custom-code development) and SWIFTRef API (reference data look-up) and Alliance Access Developer Kit (access to resources and services for business add-on development). SWIFT's APIs provide a supporting function to the core messaging service to enable worldwide funds transfer.
Fidor	Support their internationalisation efforts by means of allowing third parties controlled access to their infrastructure to use and leverage their services, offerings and banking license. Fidor offers their API in four groupings namely Payment API, Connect API, Reservation API and a legacy API for specific partners. It enables access to SEPA mandate, (batch) transfer and batch direct debit related functionalities.

The next chapter describes strategic considerations when opening up business models.

3.6. Governance of APIs

Successful APIs are based on a good governance model. This also holds true in the financial services industry (including APIs), where many forms of governance exist, most of them covering the dimensions described in chapter 3.4. For the purpose of this information paper we can distinguish the following forms of governance:

1. **Organisation:** This is the smallest unit of governance, as it concerns a single bank. Company policies, guidelines and Member APIs fall under this category;

2. **Community:** Standards are accepted and adopted by a group sharing common characteristics or interests, e.g. national communities, processors, banks, etc., the recent work done by the UK Open Banking Working Group is an example in this category;

3. **Industry:** Standards are accepted and adopted by a complete industry on a regional or global scale. The SWIFT standards are an example of an industry standard. SEPA and PSD also fall in this category;

4. **Universal:** Standards are accepted and adopted by multiple industries around the world. HTTP/HTTPS used for Internet communication is an example in this category.

This categorisation is well known in the financial industry, and we will see in the next chapter how APIs and their governance are developing along these lines.

3.7. API standardisation initiatives in the payments industry

Recent years have seen the number of industry initiatives with the aim to create standards for APIs grow. There is some evidence that APIs are likely to become a permanent fixture for banks. The table below provides an overview of some of the most relevant API standardisation initiatives. This table is non-exhaustive as additional initiatives may exist that are less visible at the time of writing.

Table 3: *Overview of API standardisation initiatives (non-exhaustive)*

#	Standardisation Initiative	Description	Governance	Link to website
1	Open Banking Working Group (OBWG) UK	The UK Open Banking Working Group set out an Open Banking Standard to address technical design and infrastructure issues, as well as formalising an approach to sensitive customer issues such as consent, delegation of access rights, authorisation and authentication, vetting, accreditation and governance. The group is targeting a minimum viable product for an Open Banking API by the end of 2016, with personal customer transaction data included on a read-only basis from the beginning of 2017.[3]	121 parties involved with diverse backgrounds	http://theodi.org/open-banking-standard
2	CAPS	The CAPS framework consists of three layers: PSD2 Layer (TPPs can connect to many AS-PSPs through one API standard, banks are compliant with PSD2 regulation), CAPS Framework Layer (optional additional guaranteed quality of services and for managing authentication, liability controls, dispute management and mobility) CAPS Plus Layer (additional value added services beyond PSD2 regulation, e.g. bank verified age or postal address)	Founding members: Equens SE, Nets and VocaLink Other members: SIBS, PayPal, Fidor, Bankgirot, Isabel Group, Open Bank Project	http://www.europeanpayments-council.eu/index.cfm/newsletter/article/?articles_uuid=42210000-5056-B741-DB0C-D1AA4E9F34EA
3	Open Bank Project	Open API and App store to build innovative applications and services based on the account holders' transaction data. Enables banks to offer an ecosystem of third party apps and services, by connecting banks, software developers and account holders	Founded by Simon Redfern and led by TESOBE	https://openbank-project.com
4	Open API initiative	Open, technical community that focuses on creating, evolving and promoting a vendor neutral, portable and open source description format.	Created by a consortium under the Linux Foundation	https://openapis.org
5	IXARIS Open Payment Ecosystem	Open source for developers to build customisable payment applications for banks to deploy. Only secure and compliant applications will be published on the Payment Application Store of Ixaris	IXARIS, backed by EU Horizon 2020 under the Open Disruptive Innovation Scheme	https://www.ixaris.com

[3] Accenture Payment Services: "Seizing the opportunities unlocked by the EU's revised Payment Service Directive"

6	Open Financial Exchange (OFX)	Standard to allow exchange of data between software and banks. Enables features such as access to transaction data, initiating payments and transfers, and recently multi-factor authentication, but does not support secure third party delegation	US – Created in 1997 by Microsoft, Intuit and CheckFree. Aimed at the US and supported by over 5500 banks and brokerages	http://www.ofx.net
7	Financial Transaction Services (FinTS)	Publicly available open protocol for a banking frontend and interface. Enables features such as regular banking services, wealth management services, security, functionality and aggregation of accounts from different institutions	Germany – Created in 1995 and managed by Deutsche Kreditwirtschaft, the German Bankers association	https://www.hbci-zka.de/english/
8	Banking Industry Architecture Network (BIAN)	BIAN brings banks, software companies and service providers together to develop a service-oriented architecture standard for both external and internal interfaces to ensure interoperability between IT systems of different banks to create a common IT services landscape.	Financial institutions include but are not limited to ABN-AMRO, ING, Rabobank, Erste, Crédit Suisse, Société Générale and UniCredit Group with partners such as Microsoft, IBM, SAP, ACI, Capgemini and SWIFT amongst others	https://bian.org
9	Berlin Group	Started in 2004 with the main goal of meeting the aims of the European Payments Council, the European Central Bank and the European Commission with regards to SEPA with a special focus on the SEPA Cards Framework. Developed a feasibility study that set a common standard for the implementation of bilateral card transaction processing between acquirers and issuers in Europe. Definition and maintenance of standards is the sole current focus.	28 card companies from 12 Eurozone countries. Together these companies represent 18 billion card transactions within SEPA.	http://www.berlin-group.org

10	W3C Web Payments Interest Group	The mission of the Web Payments Interest Group, part of the Web Payments Activity, is to provide a forum for Web Payments technical discussions to identify use cases and requirements for existing and/or new specifications to ease payments on the Web for users (payers) and merchants (payees), and to establish a common ground for payment service providers on the Web Platform. The overall objective of this group is to identify and leverage the conditions for greater uptake and wider use of Web Payments through the identification of standardization needs to increase interoperability between the different stakeholders and the different payment methods.	130 experts from a wide range of institutions, from all regions across the globe.	https://www.w3.org/Payments/IG/

Most of the above initiatives cover the full scope (legal, operational, functional and technical) as described in chapter 3.4. The initiators and governing bodies are diverse in their representation.

The position of the initiatives in terms of scope is summarised in figure 3 below.

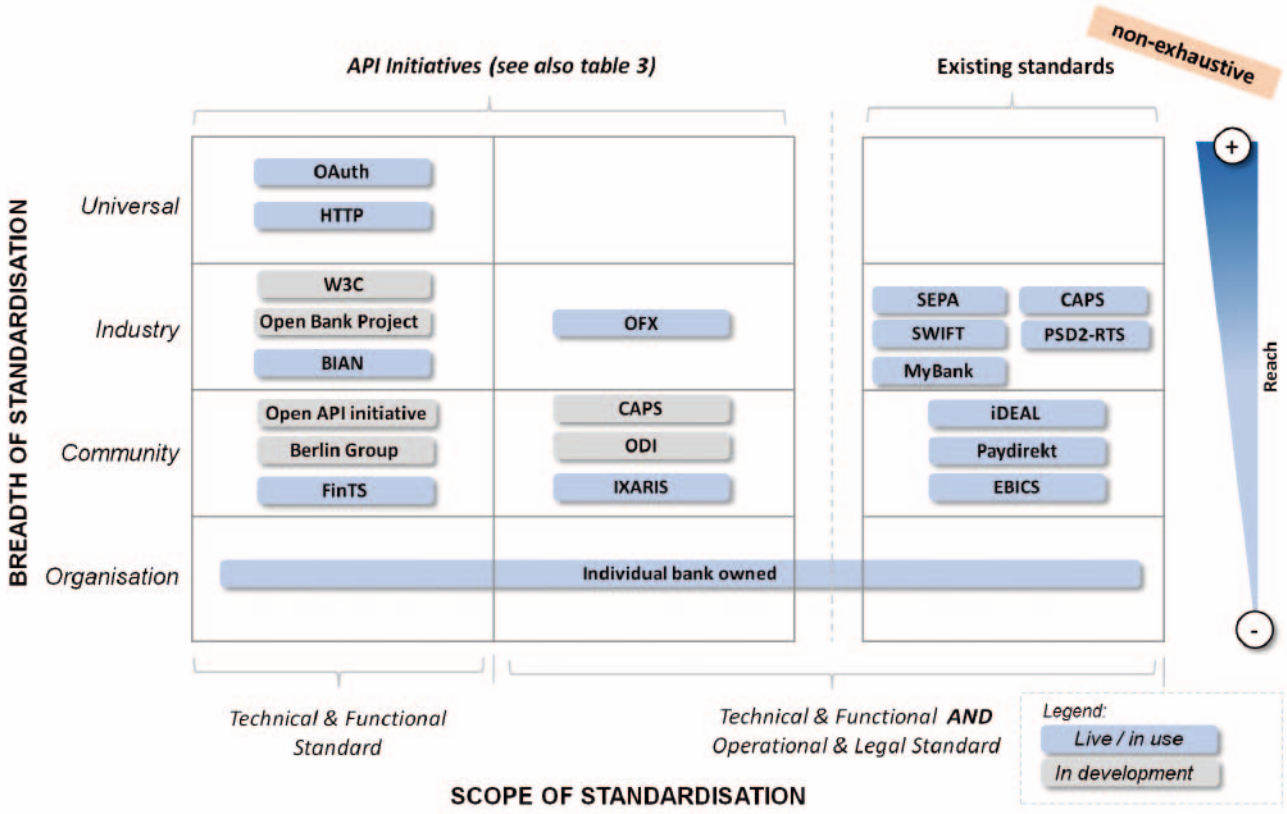

Figure 3: *Positioning of examples and API initiatives*

Unlike initiatives such as SEPA and Instant Payments, where banks have taken the lead in payment infrastructure standardisation, so far it is the supplying industry (technology or service providers) who are taking the lead in the development of API standardisation.

3.8. From 'Open API' to 'Open Banking'

Open Banking is another term frequently used within our industry, although this term is still under development. There are several definitions in use, for example coming from the Open Bank Project[4] and the UK Open Banking Working Group.[5] In both cases Open Banking revolves around the standardisation of how banks share their own data, but also how banks allow customers more choice and sharing of their data for use in third party (fintech) applications in a secure and resilient fashion. Open Banking can be characterised as a technology-driven evolution of the banking business.

In summary, we have so far discussed the following definitions surrounding APIs:

API	An interface that should be scalable, reusable and secure while offering ease of use for developers through self-service
Open API	API for developers outside of one's organisation, including standard agreements beyond technology
Open Banking	Evolution of banking, leading to more transparency, customer choice and customer control over personal data

As such Open Banking is a movement 'bridging two worlds', i.e. making it possible for customers to use their banking service in the context of other (fintech) services, thereby, combining innovative functionalities from banks and non-banks with reach through infrastructure.

Functionally Open Banking is about how banks share their own products (i.e. services, functionality and data) and how they enable their customers to share their data and account functionality with third party (e.g. fintech) applications in a secure and resilient fashion. As customers drive the actual uptake of such innovations, the concept of 'customer ownership' is changing towards a concept of 'customer sharing' between banks and third party developers, as we have seen in chapter 3.2.

Now that we have a working definition of Open Banking, we will look more closely at what this means for business leaders in banking.

[4] https://openbankproject.com

[5] http://theodi.org/open-banking-standard

4. OPEN BANKING FROM A BANK'S PERSPECTIVE

Open Banking has major implications for practitioners in our industry. This chapter shows how Open Banking challenges traditional assumptions by creating new opportunities in product creation and distribution.

On the one hand, APIs enable organisations to dissect their products into services, functionalities and even into raw data, while, on the other hand, Open Banking enables new forms of distribution and enhanced servicing capabilities, in a scalable and secure fashion, with a widespread distribution network through third party partnerships.

Banks will have to make strategic choices with regard to the role they want to play in creating value for their customers and how they want to define their relationship with the fintech community.

4.1. API: pivot between products and distribution

Traditionally, banks have not only provided their customers with products but have also been responsible for the distribution of these products, i.e. the bank distributed its payment products through its own banking channels, such as mobile, web and branches. In this traditional scenario, the bank controls the entire product and distribution chain.

Open Banking redefines both product and distribution as the principles (re-usable, scalable, secure, self-service), technologies and agreements of Open Banking allow for new possibilities. The below illustration shows where APIs fit in between products and distribution.

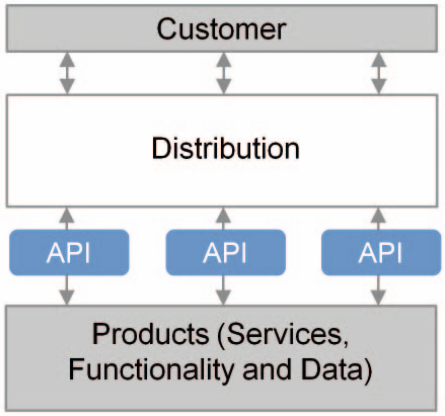

Figure 4: *APIs are the pivot between products and distribution*

Using APIs for interfacing between product and distribution enables banks to decouple these functions. The combination of decoupling and opening up allows banks to play different roles in the financial value chain with regards to the offering of products and the distribution of these products.

If private APIs are made available to third parties (i.e. turning them into Open APIs), new combinations of services, functionality and data as well as novel distribution channels may be created. Third parties can then integrate bank functionality, data and products into their own services, e.g. payment initiation, personal finance management and credit card information.

The next chapter describes four potential roles in the financial value chain that show various ways forward for decision makers when it comes to dealing with Open Banking.

4.2. Four potential roles in the financial value chain

When extending the concept of 'API as pivot', decision makers of incumbent institutions face two fundamental strategic questions:

1. **Who is distributing my products, which I make accessible via my API, to existing and new customers?**
2. **Who is creating the products that I will be distributing to my own customer base?**

Based on these two questions, four generic roles in the financial value chain may be defined as illustrated below: integrator, producer, distributor and platform.

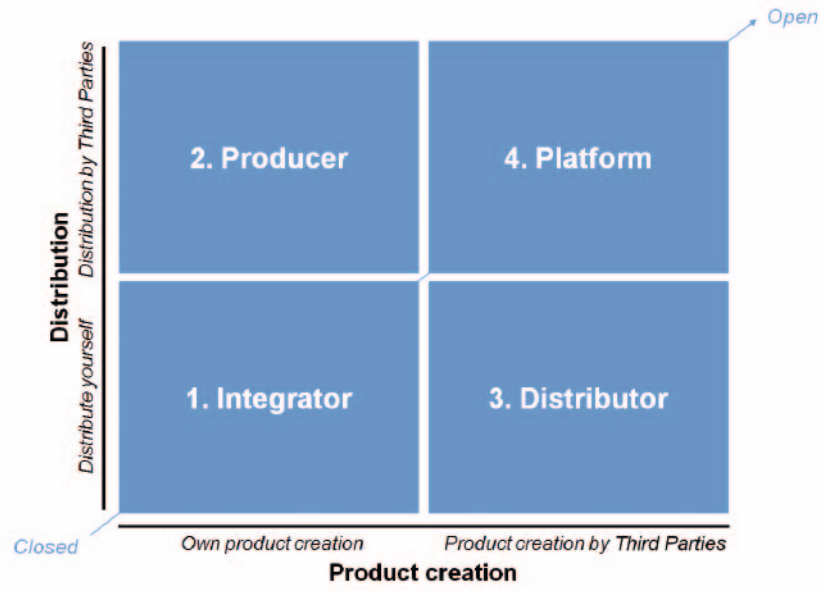

Figure 5: *Potential roles in the digital value chain*

Most of the larger financial institutions already play roles 1, 2 and 3 (integrator, producer and distributor) at the same time (often assigned to different business lines or products), whereas role 4 (platform) is still at a very early stage of its development.

Role 1: Integrator

In this role the offering to the customer is exclusively created and distributed by a single party as illustrated below.

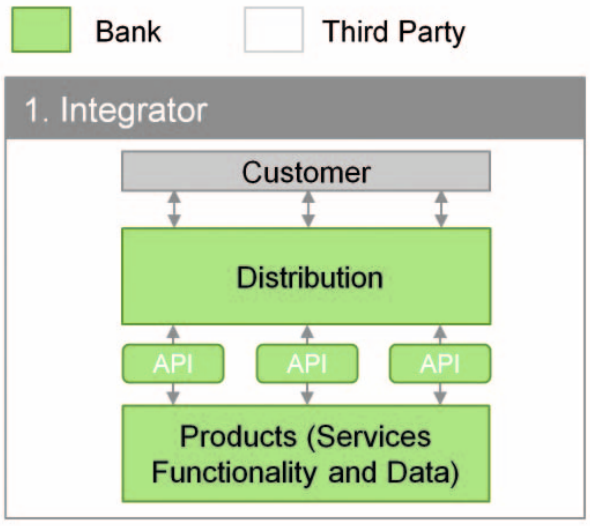

Figure 6: *Model for the Integrator role*

The result is that distribution and products are provided under one brand and that the customer experience is fully controlled by the bank. Currently, most banks play the role of integrator, as they control the whole value chain, and have also done so in the digital space since the early days of the Internet. For instance, account information and payment services are distributed via the bank's online and mobile channels to the consumer.

Integrator roles also exist outside of the financial services industry, e.g. consumer retail: The Body Shop and Nespresso are examples of organisations that operate as integrators in the retail value chain with their own distribution channel and branding.

Role 2: Producer

In this role, the offering to the customer is created by a minimum of two parties. The bank creates the service, while an external party (e.g. traditional channels or fintechs) distributes the service to the customer, who is often also a customer of the bank. Most examples in table 2 fall in this category. Note that the producer role works for certain products and business lines and that other product categories could be delivered through the integrator or distributor model.

When it comes to partnering in this way, customer ownership and branding could be challenging issues for the parties involved. This is true in particular for fintechs, which often focus on the end-customer. Some fintechs can be regarded as innovative IT providers and therefore the customer ownership remains with the bank. In this case, banks are not part

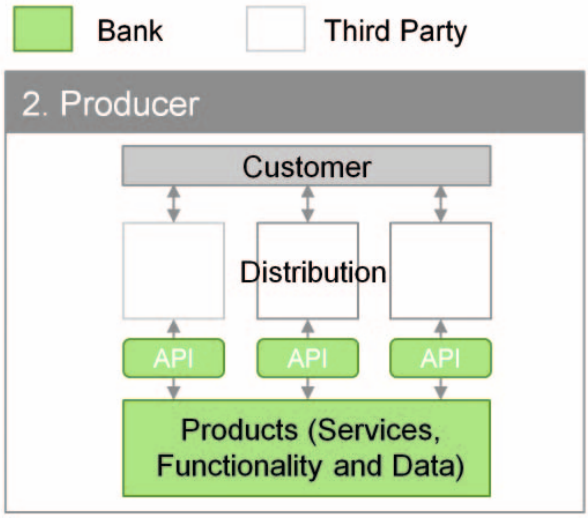

Figure 7: *Model for Producer role*

of the producer role but of the distributor role (see next chapter).

The PSD2 'Access-to-Account' provisions highlight the producer role as banks open up and move from the integrator to the producer role, in particular with regard to account information and payment initiation services. While most of the larger banks are working on a fintech collaboration strategy, some banks are less inclined to adopt a producer role. Extra revenues and innovation may seem attractive, but may carry with them increased regulatory and compliance risks.

In the B2B space, producer roles are already embraced to create reach through distribution, in general through private APIs for functionalities such as data sharing and payment initiation. Examples are integrations of bank functionalities with ERP and accounting software providers such as SAP, Magento and Oracle.

The producer role is being increasingly explored by banks nowadays, as is evident from the number of bank sponsored 'accelerators', 'incubators', 'developer portals' and 'hackathons' across the globe.[6] A large part is still experimental, as 'opening up' involves many challenges, especially when the busi-

[6] http://themoneywiki.com/wiki/fintech-incubators-accelerators

ness needs to continue to run while undergoing change. “Running the business” involves legacy systems, mature compliance functions, bureaucratic silos in organisations, potential reputational risk and often divergent internal positions regarding the appropriate strategic direction. All of these elements are bank-specific and do not yet apply to fintechs.

Banks typically provide services, functionality and data either directly or through partners. This implies that they will typically play the roles of integrator and/or producer. A bank is unlikely to only play the role of distributor or platform (without being and integrator or producer at the same time) as these roles build upon the integrator and/or producer role. This will be clarified in the next sections.

Role 3: Distributor

Open Banking strategies can also be instrumental in leveraging a bank’s Internet and mobile ‘distribution channels’, which have built up a digital customer reach over the past 15 years:

- In 2015, 47% percent of the population in the Eurozone accessed online banking sites, with Finland leading the group with 86%;[7]
- There were 51 million mobile banking customers in Europe in 2013 (42 million mobile phone banking and 19 million tablet banking users). This is predicted to grow to 214 million in 2018 (99 million mobile phone banking and 115 million tablet banking users);[8]
- In the Netherlands, one third of the consumers check their balance statement once a day. On average it is 3.5 times per week.[9]

With banks opening up and other, non-financial service providers adding Open API access to their services, banks could consider to extend their digital market presence by distributing third parties services and thereby adopting the role of a distributor. In this role a bank offers third party products through its own distribution channels. This is not a completely new concept as for example banks have been distributing funds of other institutions or payment services of card schemes. Challenges regarding customer ownership and branding are similar to the ones the producer role faces.

Today, fintechs (especially e-commerce PSPs) typically act as distributors within the payments industry, as they repackage and distribute payment services created by banks (and other payment service providers such as PayPal, Klarna and Sofort). However, banks could also, according to the PSD2 provisions, extend their role as distributors to become third party providers themselves when offering account aggregation and payment initiation services of payment accounts held at one or more other banks or fintechs.

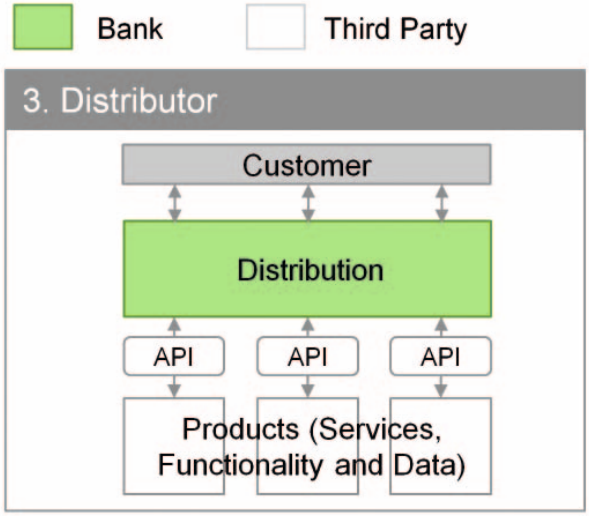

Figure 8: *Model for Distributor role*

[7] http://www.statista.com/statistics/222286/online-banking-penetration-in-leading-european-countries/

[8] https://mobiforge.com/research-analysis/global-mobile-statistics-2014-section-g-mobile-banking-and-m-money-section-h-venture-capital-vc-inve#m-banking

[9] https://www.nibud.nl/wp-content/uploads/Geldzaken-in-de-praktijk-2015.pdf

Role 4: Platform

A platform[10] (as a 'business model') facilitates the business of others by acting as an intermediary. This is often referred to as 'peer-to-peer' business. As a platform, banks could offer the following capabilities: matching of parties, security, Know Your Customer (KYC), etc. Note that the meaning of 'platform' as a business model is different from platforms in the IT world, where a platform refers to the IT infrastructure needed to run a bank in general.

Banks as platforms are not common, although Germany's Fidor Bank[11] is an example. A number of fintech market participants have adopted this model as a starting point in lending (Lendify, Zopa), crowd-funding (Kickstarter, Ecocrowd) and broker roles (eToro, DeGiro).

The platform role is illustrated below, showing that the bank does not act as a provider or distributor, but as a facilitator for third parties and their customers. Peer-to-peer or platform business does not affect the balance sheet of a bank. Again it should be noted that banks may allocate different roles to different lines of business, and this includes the platform role.

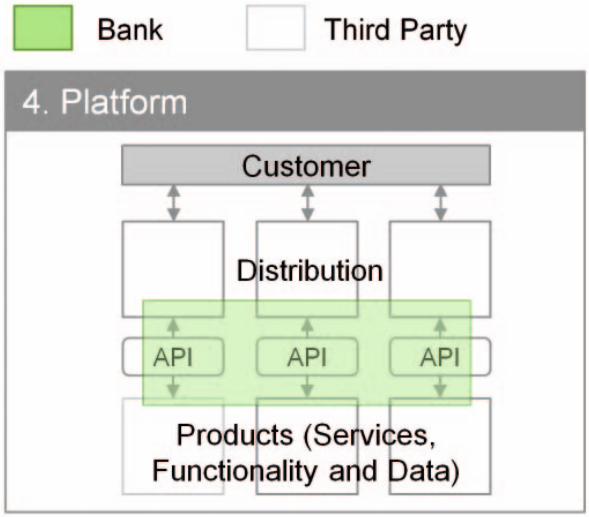

Figure 9: *Model for Platform role*

In today's networked and digital era, the competitive landscape is increasingly defined by platforms, which have transformative potential (e.g. Uber, AirBnB, iTunes) in keeping with the motto "build a better platform, engage a community and you will have a crucial advantage".[12] For the financial industry the phenomenon of platforms still has to be further developed. For payments and personal information this is expected to gain traction through the PSD2 provisions, as third parties can engage in service provisioning without actually owning bank assets.

The four roles summarised

The figure below summarises the four roles in the financial value chain described above.

[10] Platform can also refer to the technical foundation of computer systems, not to be confused with the meaning of the same term in the context of business models.

[11] http://www.fidor.de

[12] https://hbr.org/2013/01/three-elements-of-a-successful-platform

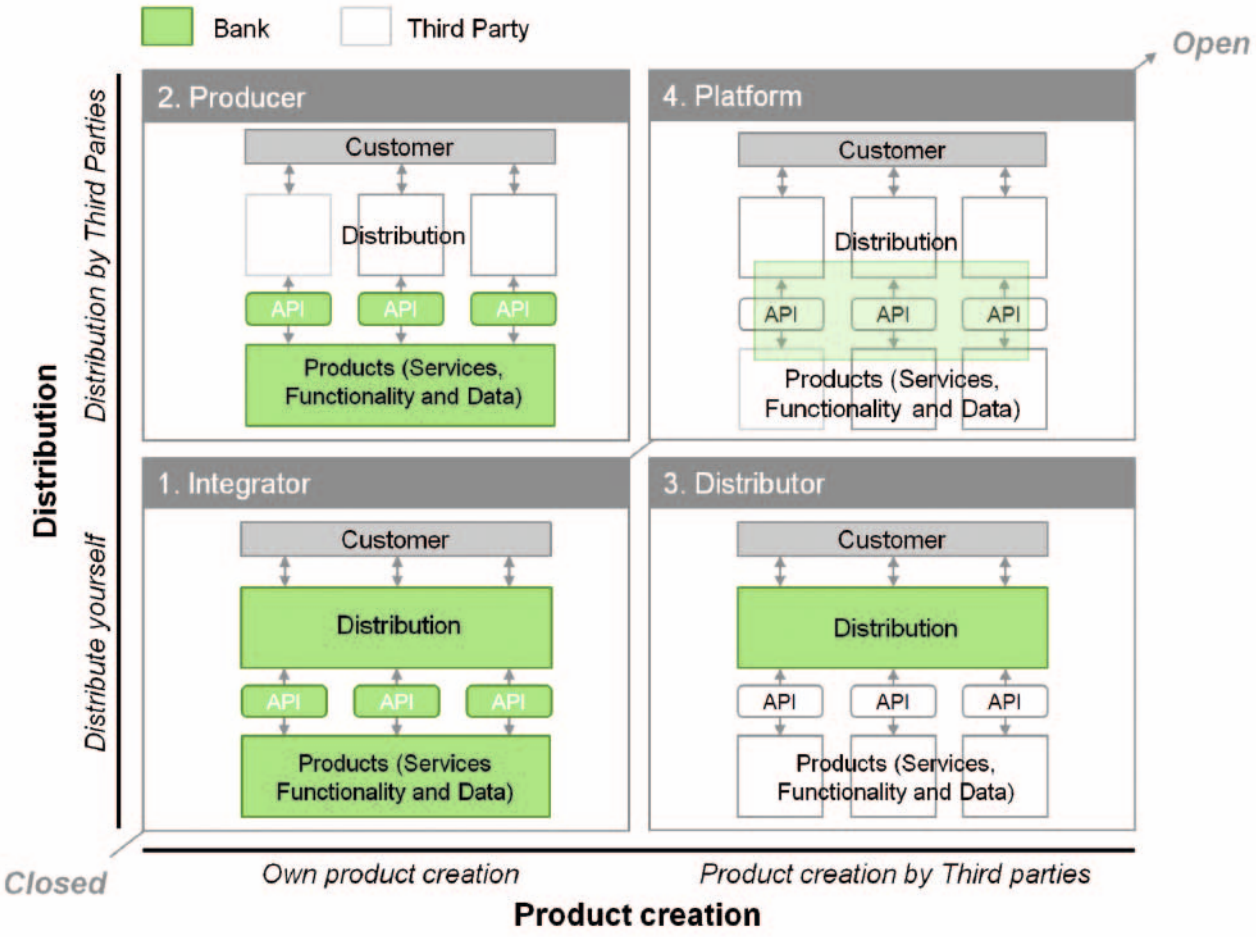

Figure 10: *Potential roles in the financial value chain*

Embracing a new role in the financial value chain entails transformational challenges as it requires a change in the business and operating model. Criteria to consider when evaluating the level of strategic change include customer loyalty, market propositions, cost efficiencies, innovation culture, employer attractiveness, business and IT alignment, available means for investing and possibly outsourcing.

This is a crossroad which every bank could face in the next few years. The minimum engagement in 'opening up' is what the PSD2 will prescribe in terms of access-to-account (i.e. a limited 'producer role'), but the current fintech and innovation boom also poses questions regarding business strategies for partnering and product proposition towards third parties.

5. CHALLENGES AND OPPORTUNITIES FOR BANKS WHEN OPENING UP

The previous chapters outlined the concept of Open Banking and its various dimensions. This chapter provides a summary of current observations of banks' attitudes regarding opening up.

5.1. The concept of opening up

'Opening up' is similar to the first mover experiences in non-financial industries of the past decade, and holds major opportunities in a challenging environment. This environment can be characterised in the following manner:

1. **Zero tolerance for mistakes. Reputation and security risks due to the role in the economy as a crucial infrastructure.** Providing security of funds and personal data as well as transaction banking can be seen as the core value proposition of a bank. As a provider of crucial infrastructure banks face additional pressures related to maintaining and making changes to running a large-scale operation with the considerations of constant uptime.

2. **Banks operate in a strict and changing regulatory environment.** Although the roadmaps of the upcoming regulations have been clearly communicated to banks, their interpretation and understanding of strategic consequences and realising compliance in the most efficient way are time and cost intensive processes.

3. **Banks have already digitised their customer facing (distribution) side since the early years of the Internet.** This has proven to be difficult considering the highly customised, overlapping and interrelated legacy IT infrastructures, which are not necessarily 'digitised in parallel'. This complexity makes these infrastructures costly to adapt and maintain.

'Opening up' within the abovementioned environment provides a host of opportunities that come with the ability to safely provide new products and services in more innovative ways. The following chapters summarise the perceived challenges and opportunities that are associated with opening up.

5.2. Challenges for banks when opening up

Three challenges are of particular importance for banks when opening up:

Challenge 1:
Risk of disintermediation by third parties

Customer retention could come under pressure as it can be expected that Open Banking will become the new normal for certain groups of customers in the near future. However, this opening up comes with the risk of accelerated disintermediation of the banks' role as the de facto financial services provider. This could lead to a partial loss of the client relationship with the associated downward pressure on cross-selling opportunities.

Challenge 2:
Risk to reputation and trusted brand

Open API brings with it a host of security-related challenges such as potentially fraudulent third parties, digital intrusion, impersonation, illicit use of data, and customer privacy concerns. Providing security of funds and personal data are the core pre-requisites for the financial industry by means of transactional and custodial services. From a customer perspective trust is the common denominator and the basis of these products. The reputation of a bank depends on how trustworthy the customer perceives its services to be. The implications of the PSD2 Access-to-Account provisions will further increase customer awareness of data ownership and security. Banks therefore need to consider how to set up a governance control model to ensure that participating third parties will not damage their reputation.

Challenge 3: Transformational challenges

On the technical side, banks face the challenge of providing the API functionality, with its associated load on IT infrastructures, to third parties while maintaining their current operational standards. The exist-

ing capabilities such as fraud detection and KYC as well as general security and transaction monitoring standards will also need to be updated to address security concerns.

The revenue-related facets of Open APIs pose a range of challenges to banks. If a bank cannot provide relevant propositions, within short timeframes, there will be competitive consequences. These consequences could include deterioration of the customer base to the point that the bank may not be able to benefit from economies of scale anymore. As a result, banks whose business model relies on high-scalability will experience cost pressure due to decreased volumes.

The technical challenges and the challenges arising from the transformation of the banks' value proposition can also be described as the organisational challenges that a bank faces on its way to becoming a digital services provider. These challenges include issues related to bureaucratic silos, resistance to change, internal focus as well as differing stances regarding the appropriate strategic direction. Another organisational challenge will be co-operation and dispute resolution with third parties.

At an industry level, the changes that come with Open APIs will also change the current business models. This calls for an industry-wide dialogue where the collaborative domain for Open Banking should be defined. Seeing that there are fundamental differences in customer behaviour, regulatory interpretations by member states and technical infrastructure at a national level this dialogue would most likely need to occur at a national level in coordination with an EU-wide approach.

5.3. Opportunities for banks when opening up

Open Banking also provides a number of opportunities for banks:

Opportunity 1: Enhanced service innovation

Opening up provides banks with the ability to enhance their current service offering in two distinct ways:

- Extend current offering: The expansion of current products and services beyond payment or account services, i.e. towards digital identity services.

- Move into new space: Taking advantage of sharing and aggregating client data from different accounts and enriching existing data with that of partner banks and/or fintech market participants. This can lead to enhancements in product and service innovation by means of improved data analytics. Examples of this include cost effective and more reliable customer credit ratings and instant loans.

Opportunity 2: Wider and improved distribution

The uncertainties surrounding service provisioning currently prevent banks from distributing their product offering through the digital platforms of other banks or third parties.

Opening up within an Open Banking-based environment already provides a standardised shared service provision model. This model can be used to distribute multiple products and services across multiple platforms and devices in tandem with other banks and/or fintech market participants.

In the software or telecommunication industries the practice of offering customers a host of different services for one discounted rate is called bundling. Within an Open Banking environment bundling can now be easily used as the vehicle with which products and services can be distributed to the customer. This enables the client to pick and choose a range of specific product offerings (possibly across different banks and fintech market participants) and thereby increasing customer relevance through customisation.

Opportunity 3: Enhanced risk mitigation

A standardised approach to the distribution of products and services also allows for a standardised approach to security. In this way banks can enhance their branding as a safe and trusted party while benefitting from improved reach. The improved information sharing between banks is also expected to improve decision-making and mitigation measures regarding fraud prevention, KYC and Anti-Money Laundering (AML).

6. KEY OBSERVATIONS ON OPEN BANKING

The previous chapters have described Open APIs, Open Banking and how decision makers in the financial services industry may position the upcoming changes. The most important observations can be summarised as follows:

1. **Open APIs could pave the way for Open Banking.** The current fintech developments and in parallel the adoption of PSD2 have fuelled the discussions on openness in banking, i.e. the use of Open APIs to enable Open Banking business strategies. At least ten community initiatives on Open APIs and Open Banking have appeared, none of which are driven by banks.

2. **Open Banking affects existing processes in products and distribution.** Product and distribution strategies have always been at the core of what banks do. Open Banking with its digital technologies provides new possibilities and challenges in terms of scale and scope to products and distribution in the digital era.

3. **Banks may have to make strategic choices in dealing with Open Banking.** Banks are challenged to find and express their own unique selling proposition to co-create value in open business environments. Bank practitioners might need to review their strategies in terms of products and distribution as well as to explore new business models that move beyond current offerings.

4. **Industry API standards could maximise the benefits and value of openness in banking if they move beyond being mere technical standards.** Standards are required to create interoperability and enable cost-effective and easy integration. The level of acceptance in the industry of API standards is key to success and is determined by the scope of the user group (individual, community, industry, and universal) defining the standard, as well as the scope of standardisation (i.e. technical, functional, operational and legal). Financial services require security, privacy and compliance, therefore API standardisation will have to develop beyond technical and functional aspects by including legal and operational aspects as well as governance. Last but not least, using standards could reduce the overall investment and risk per institution.

5. **Open Banking with standardised Open APIs as the enabling technology is still in an infancy stage.** Given all current developments rapid and collective maturity can be expected. This could lay the foundation for an industry-wide dialogue, engaging bank and non-bank stakeholders.

An essential period lies ahead of the payments industry in which new strategies will have to be forged, partially driven by regulation and also by opportunities arising from changing customer demands.

APPENDIX 1: OVERVIEW OPEN API BUSINESSES

Organisation	Operating model	Consumer relevance
PayPal	**Name of initiative**: PayPal Developer	**Consumer** The end user of the product is classified by segment, experience and expectations when the API is developed in a "working back from the customer" approach. **Corporate** A developer-centric approach is taken towards tools, processes, technology preferences and the role of the API to make quick and cost effective applications and integrations possible.
	Chief objective: Enabling developers to develop applications 'on top of' the platform.	
	Type: Developer portal	
	Offering: API offering includes invoice management; process split or chained payments and account management. The APIs are also very well documented.	
	Launch date: PayPal have been offering APIs since 2004.	
	Supporting initiative: Various hackathons such as Battlehack 2015 to test APIs and developer advocacy.	
	Additional figures: Paypal hosts 162 million digital wallets and serves more than 2 million third-party developers.	
salesforce	**Name of initiative**: Salesforce Platform APIs	**Customer** Customers benefit from an improved customer relationship management experience. **Corporate** Apart from extending the web applications to their corporate clients APIs are also used to assist clients in their accessing their information on a reliable basis. This data can then be integrated or used in proprietary applications for improved customer relationship management.
	Chief objective: Syndicate products and services across different platforms.	
	Type: Developer platform	
	Offering: A collection of APIs for data access, development tool creation, working with large data sets and social data analysis.	
	Launch date: February 2000	
	Supporting initiative: n/a	
	Additional figures: Salesforce won the *Forbes Most Innovative Company* award 4 years running from 2011 to 2014.	

twitter	**Name of initiative**: GNIP	**Consumer** Due to the use of APIs Twitter's customers can access Twitter and tweet on multiple platforms such as mobile, PC as well as other social networks such as Facebook and LinkedIn. **Corporate** For corporate clients Twitter has developed a stand-alone API platform called GNIP for the analysis of real-time and historical social data and sentiment analysis. Twitter also uses its own API to embed tweets in their applications.
	Chief objective: Syndicate products and services across different platforms	
	Type: Developer platform	
	Offering: Full-Archive Search API (historic archive of Tweets), Data Collector (data collection across various social networks), Insights (Analysis of Tweets) and Powertrack (advanced Tweet filter).	
	Launch date: September 2006	
	Supporting initiative: n/a	
	Additional figures: Tweetdeck was a third party provider who built a better user experience on Twitter and was later acquired by Twitter for €28 million. 25 billion activities are recorded on the GNIP Twitter platform on a daily basis.	
LinkedIn	**Name of initiative:** LinkedIn Developer	**Customer** Apart from improving the general experience the extension of a customer's LinkedIn identity for logging in and accessing other services is also made possible with APIs. **Corporate** Through the use of LinkedIn's APIs companies are able to automate and manage the activity of their company's pages as well as use LinkedIn capabilities for their marketing, recruitment, public relations and sales.
	Chief objective: Social sharing/enabling developers to develop applications 'on top of' the platform	
	Type: Developer portal	
	Offering: APIs that enable authorisation on other websites through the "Sign in with LinkedIn" button, certification provision by universities, content and permission management for company profiles. A mobile SDK is also provided.	
	Launch date: November 2009	
	Supporting initiative: APIs are extended with Partner Programs that provide support to companies in the areas of marketing, recruitment, public relations and sales.	
	Additional figures: LinkedIn has decreased the number of open APIs from ten to four.	

	**Name of initiative**: IBM Watson Developers Cloud. Watson is IBM's natural language and processing platform that allows computers to work in a more human way.	**Customer** The first commercial application of Watson was in providing customised treatment for lung cancer patients. **Corporate** The oncology ward of Memorial Sloan Kettering is able to make patient care decisions based on the latest medical research and leverage their expertise.
	Chief objective: Enabling developers to develop applications 'on top of' the platform.	
	Type: Enabling developers to develop applications by accessing Watson via their cloud technology.	
	Offering: This will include a developer toolkit, educational materials and access to Watson's API. Tone Analyzer, Emotion Analysis and Visual Recognition are some of the latest APIs.	
	Launch date: November 2013	
	Supporting initiative: IBM Watson Content Store	
	Additional figures: 1 million users have already signed up for the service.	

APPENDIX 2: OVERVIEW OPEN API INITIATIVES - PAYMENTS

Organisation	Operating model	Consumer relevance
CRÉDIT AGRICOLE	**Name of initiative**: API CA Store	**Customer** Improving engagement and customer relationships with clients. Applications include social applications and games as well as an application that supports sight-impaired clients.
	Chief objective: Enabling developers to develop applications 'on top of' the platform.	
	Type: Developer portal	
	Offering: 14 APIs that provide API authentication, credit and location-based functionalities amongst others.	
	Launch date: September 2012	
	Supporting initiative: The CA App store. Co-creation with developers via branches. Ongoing workshops with developers and clients. Dedicated Software Development Kit (SDK) for application development.	
	Additional figures: Over 100,000 site visits per month for the first three months. 42 applications built upon APIs that provide authentication, credit and location-based functionalities.	
BBVA	**Name of initiative**: BBVA API_Market	**Customer** Applications that enable intelligent consumer lifestyle choices such as timing of restaurant visits and recommendations and money transfer services. **Corporate** Applications for the assessment of new business ventures, sporting events and direct marketing in shopping malls.
	Chief objective: Enabling developers to develop applications 'on top of' the platform.	
	Type: Developer portal	
	Offering: APIs that enable authorised third parties access to money transfer and other services on behalf of the client, profile and account data and aggregated card profiles.	
	Supporting initiative: InnovaChallenge – a competition for application creation with the BBVA APIs. BBVA also created the Head of Open API role at the bank.	
	Additional figures: During the InnovaChallenge in 2013 BBVA had 144 applications developed from 780 developers from 19 countries. The approximate development time is estimated at €2.9 million.	

VISA	**Name of initiative**: Visa Developer	**Customer** To provide customers with new commerce experience based on Visa technology. Example APIs include Visa Checkout. **Corporate** Providing support to their industry partners to deliver these customer experiences. Example APIs include the Funds Transfer Attributes Inquiry API. Visa's goal with the platform goes beyond it being a network access point but a global distribution platform for its products and services by using APIs to unbundle their services.
	Chief objective: Enabling developers to develop applications 'on top of' the platform.	
	Type: Developer portal	
	Offering: The 40 APIs are classified in four categories namely Payment Methods, General Services, Risk and Fraud as well as Trial.	
	Launch date: February 2016	
	Supporting initiative: A trial with selected financial partners was held before the launch and there are dedicated Visa Developer engagement centres in San Francisco, Dubai, Singapore, Miami and São Paolo.	
	Additional figures: Visa had been in existence for close to 60 years before they made the decision to open their payments network.	
MasterCard	**Name of initiative**: Mastercard Developer Zone	**Customers** To enable an improved retail customer experience and provide merchants with higher conversion rates through APIs such as the Masterpass In-APP Purchasing API. **Corporate** MasterCard's API such as the Masterpass In-APP Purchasing API provides e-commerce merchants with the ability to provide purchases within their applications and improve conversion.
	Chief objective: Enabling developers to develop applications 'on top of' the platform.	
	Type: Developer portal	
	Offering: 21 APIs classified in three categories namely payment, data services and security. The APIs were developed for the acquirer, issuer, merchant and "other developer" user types.	
	Launch date: May 2010	
	Supporting initiative: In 2015 the Developer Zone was supported by Masters of Code, a series of international hackathons that focused on connecting innovators with venture capitalists.	
	Additional figures: The Masters of Code hackathon prize is valued at US$ 100,000 and is held in ten cities worldwide.	

	**Name of initiative**: SWIFT APIs	**Customers** SWIFT's APIs provide a supporting function to the core messaging service to enable worldwide funds transfer. **Corporate** SWIFT alliance members can develop custom code, retrieve financial data and access additional resources and services.
	Chief objective: Enabling developers to develop applications 'on top of' the platform.	
	Type: Developer platform	
	Offering: SWIFT Integration API (custom-code development) and SWIFTRef API (reference data look-up) and Alliance Access Developer Kit (access to resources and services for business add-on development).	
	Launch date: April 2014	
	Supporting initiative: 5-day course for development and testing teams**.**	
	Additional figures: SWIFT connects 11,000 banking and securities organisations in more than 200 countries and territories.	

APPENDIX 3: REFERENCE DOCUMENTS

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APPENDIX 4: GLOSSARY

API – A language and message format used by software applications to communicate with each other.

Account Servicing Payment Service Providers (AS-PSP) – Banks that provide current accounts with a payments functionality to their customers.

API Design – The design of the API with the aim of assuring performance, scalability and simplicity, the most popular design principles being SOAP and REST.

Closed API – APIs used within one organisation.

Co-creation – The process of creating customer value through collaboration among multiple parties.

Conversion – The provisioning of seamless, easy-to-use payment services towards payers and payees.

Data Access – The process of controlling access to data. The most commonly used standards for this being SAML and OAuth 2.0.

Data Exchange – The format in which API data is encoded with JSON and XML being the most popular formats.

Data Transmission – The means by which data is transmitted with APIs of which HTTP is the most widely used format.

Developer – The technical function of third parties, making the connections to the APIs. Often used as a synonym for third party.

Disintermediation – An economics term related to the elimination of middlemen in a supply chain.

Distributor – A role in the financial value chain where banks use their own channels to offer third party products.

Fintech – Providers of new solutions which demonstrate an incremental or radical/disruptive innovation development of applications, processes, products or business models in the financial services industry.

Fragmented – The state of a payment network where payment methods lack reach.

HTTP (HyperText Transfer Protocol) – The most popular format for API data transmission.

HTTPS (Secure HyperText Transfer Protocol) – The most popular format for secure API data transmission.

Infrastructure layer –The part of the payments infrastructure characterised by SEPA (including the standardised payment instruments SCT, SDD and cards) and the clearing and settlement systems that offer end-to-end trusted reach.

Integrator – A role in the financial value chain where the offering to the customer is exclusively created and distributed by a single party.

JSON (JavaScript Object Notation) – One of the most popular formats for API data encoding.

Member API – APIs for use by everyone complying with a predefined set of mandates

OAuth 2.0. (Open standard for AUTHorisation) – API data access standard.

On-boarding – Actions that need to be completed by the financial services provider such as providing know-your-customer procedures to offer customers a particular financial service.

Open API – Communication of software applications of different organisations using APIs.

Open Banking – A term that is currently still under construction but is aimed at promoting transparency as well as free and unrestricted access to knowledge and information.

Open data – Open data is the idea that some data should be freely available to everyone to use and republish as they wish, without restrictions stemming from copyright, patents or other mechanisms of control.

Open government – Open government is the governing doctrine which holds that citizens have the right to access the documents and proceedings of the government to allow for effective public oversight.

Open innovation – A paradigm developed by Henry Chesbrough that assumes that companies can and should use external ideas as well as internal ideas, and internal and external paths to market, as they seek to advance their technology.

Partner API – APIs for use by partners based on bilateral agreements

Payment Services Directive (PSD2) – European Commission directive to regulate payment services and payment service providers throughout the European Union (EU) and European Economic Area (EEA). The Directive's purpose is to increase pan-European competition and participation in the payments industry also from non-banks and to provide for a level playing field by harmonising consumer protection and the rights and obligations for payment providers and users.

Platform – A role in the financial value chain that enables a multi-sided market as it facilitates business of others by acting as an intermediary platform.

Private API – APIs for exclusive use within the boundaries of an organisation.

Producer – A role in the financial value chain where the offering to the customer is created by a minimum of two parties. The bank creates the service, functionality and data, while a third party (fintech) distributes the service.

Public API – APIs open for use by anyone.

Reach – The size of the network of participating payers and payees and an indication of the utility of participation in a payment network.

REST (REpresentational State Transfer) – An API design principle.

SAML (Security Assertion Mark-up Language) – API data access standard.

Services layer – The part of the infrastructure characterised by the presence of fintech parties that perform a customer-facing function / user experience while making use of the infrastructure layer.

Sign-up – Action that needs to be completed by the customer such as providing identification and passwords to make use of a particular financial service.

SOAP (Simple Object Access Protocol) – An API design principle.

Syndication services – Services offered when multiple market participants co-create to provide a product or service to customers.

XML (EXtensible Mark-up Language) – One of the most popular formats for API data encoding.

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