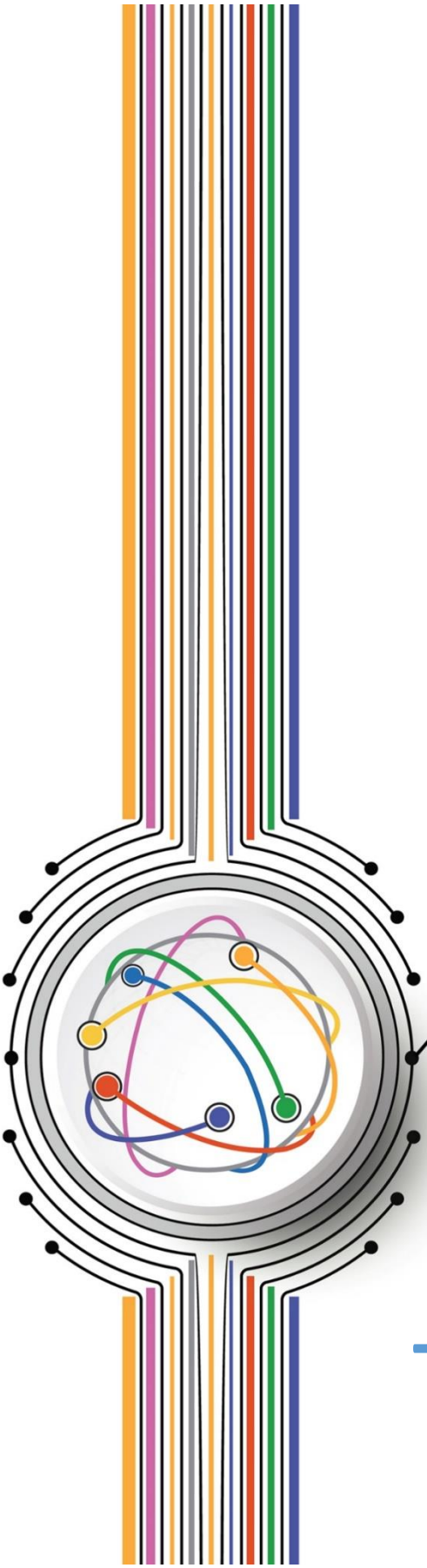

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White Paper

Open Finance to support Trade Facilitation

Version 1

Note

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The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT)

Simple, Transparent and Effective Processes for Global Commerce

UN/CEFACT's mission is to improve the ability of business, trade and administrative organizations, from developed, developing and transitional economies, to exchange products and relevant services effectively. Its principal focus is on facilitating national and international transactions, through the simplification and harmonization of processes, procedures and information flows, and so contribute to the growth of global commerce.

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1 Introduction

Over the last few years, the payments landscape has massively changed. The use of advanced technologies by traditional and new financial services providers, including Fintech, Bigtech and challenger banks, have increased the level of competition and the overall degree of innovation. In the Open Finance scenario, the Public Administration, corporate and retail customers are enabled to choose among a variety of products, that go beyond traditional banking functionalities.

The goal of the UN/CEFACT Finance and Payment domain is to investigate the economic paradigms of Open Banking and Open Finance in order to understand how they can back trade worldwide.

Far from being a comprehensive analysis of the complex and innovative Open Finance scenario, this document aims to pave the way for further studies on this topic to be carried out by UN/CEFACT and other international organizations.

2 Open Banking: the global big picture

In the last 10 years, Open Banking has emerged as an international economic paradigm. Powered by different drivers, Open Banking has been mainly the consequence of legislative obligations and market driven initiatives.

According to CBI-PwC report (2021) “open” initiatives are currently live at international level and each Country identifies the best approach to follow, according to its specific objectives and/or needs.

These initiatives are today at different stage of maturity: early stage ones, such as those currently ongoing in Saudi Arabia and Canada where Open Banking initiatives have not been formally launched, have been complemented to more mature ones, such as those already in place in Australia where Open Banking (and also Open Data) regulation is fully in place since 2019 or Singapore where Open Banking / Finance API standards have been rereleased by Monetary Authority of Singapore through an API Playbook.

They move at different paces from slower ones, such as in Mexico where the FinTech Law was instituted in 2018 but, from that moment, no further steps in data openness have been counted, to quicker ones, such as in Brazil where an Open Finance framework has been developed from scratch.

Open Banking initiatives follow different approaches from fully regulated ones, such as in the EU, Nigeria, Australia or Singapore, to fully market driven ones as in the case of the USA, where Open Banking initiatives (e.g. API standardization) are driven by market players.

This chapter sheds light on the development of Open Banking, starting from the experience of different European countries and getting to a final view on some other extra EU experiences.

2.1 Open Banking in Europe: the case of the PSD2 in the European Union

In the European Union (EU), the Directive 2366/2015/EU (Payment Service Directive 2 - PSD2), gave the light to Open Banking in Europe. The PSD2 replaced the Payment Service Directive[1], which created a single market for payments (i.e. credit transfers, direct debits, cards) and introduced the legal framework for the Single Euro Payment Area (SEPA).

[1] Directive 2007/64/Ec of the European Parliament and of the Council of 13 November 2007 on Payment Services in the Internal Market amending Directives 97/7/Ec, 2002/65/Ec, 2005/60/Ec And 2006/48/Ec And Repealing Directive 97/5/Ecs

Following the adoption and implementation of the PSD, new market players and services emerged within the SEPA, which were out of scope of the directive. Taking into account this development, the EU institutions elaborated the PSD2, with the aim "to make payments safer, increase consumers' protection, foster innovation and competition, while ensuring a level playing field for all players, including new ones."[2]

The renewed Payment Service Directive imposes the obligation for Account Servicing Payment Service Providers (ASPSPs) to share the data of online bank accounts of their customers to Third-Party Providers (TPPs), after having acquired the customer's consent. From a technical perspective, Application Programming Interfaces (APIs), which allow communication between software, have been identified as the most suited technology to enable this data sharing among PSPs.

The PSD2 has enabled TPPs to operate as Account Information Service Providers (AISPs) and Payment Initiation Service Providers (PISPs). While AISPs provide clients with a complete overview of their online bank accounts through unique front-end solutions, PISPs enable their customers to use payment initiation functionalities without acceding to their bank accounts or using their credit or debit cards.

Besides opening the market to new business models, the PSD2 strengthened security protocols to be adopted by PSPs for e-transactions. PSPs apply Strong Customer Authentication (SCA) "where the payer accesses its payment account online, initiate an electronic payment transaction, carries out any action through a remote channel which may imply a risk of payment fraud or other abuses." [3] Furthermore, the PSD2 affirms that "Member States shall ensure that payment service providers have in place adequate security measures to protect the confidentiality and integrity of payment service users' personalized security credentials." [4]

Box 1: Collaborative platforms to support the spread of Open Banking in Italy and Europe

CBI Globe – Global Open Banking Ecosystem

CBI is a Public Limited Consortium Company which comprises around 400 Payment Service Providers as shareholders and customers. Operating from a Business-to-Business-to-Customer (B2B2C) perspective, CBI delivers digital payment products and services that its shareholders can offer to the Public Administration, corporate and retail customers. In doing so, CBI allows the interaction between different ecosystems and proves to be a collaborative platform backing the development of interoperable and circular services at the domestic and European level.

Following the evolution of the European payment regulatory framework, in 2019 CBI launched an API-powered Reg Tech Platform, CBI Globe – Global Open Banking Ecosystem – to support the Italian Banking community to be compliant with the PSD2. Thus far, 80% of the Italian financial market has adopted the platform to meet the operational and technical requirements imposed by the renewed payment framework. In 2020, CBI equipped CBI Globe with

In 2020, CBI Globe has developed new functionality that allow bank and non-bank PSPs to perform the role of Third-Party Providers (TPPs) as Payment Initiation Service Provider (PISP) and Account Information Service Provider (AISP).

[2] European Payment Council, PSD2 Explained, April 2018

[3] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directive 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC, art. 97

[4] Ibid

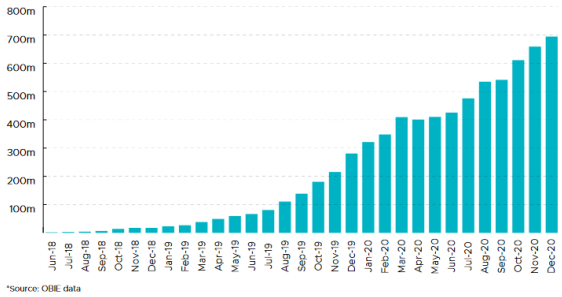
Being implemented only in 2019, the PSD2 has not achieved its full potentiality yet. Nonetheless, market players have already started developing value-added services which go beyond "mere" compliance. With the aim to meet the rapid evolution of the European markets, the EU legislator has already started reviewing the payments regulatory framework with the aim to proposing a review of the PSD2 at the end of 2021 and an Open Finance legislative framework before mid-2022.

2.2 Open Banking in the United Kingdom

In the United Kingdom (UK), the Competition and Markets Authority (CMA) sets-up the Open Banking Implementation Entity (OBIE) in 2016 to implement Open Banking Standards.[5] This entity successfully established Open Banking Standards comprising (i) Technical API Specifications, (ii) Customer Experience Guidelines and (ii) Operational Guidelines.[6]

Today, over three million UK citizens and small businesses are active users of open banking-enabled products. The ecosystem counts 301 firms that are active in the market, with another 450 in the pipeline.[7] This success is illustrated by the quickly increasing total API volume as well as the development of large catalogue of Open Banking based use cases:

Total API Volume



*Source: OBIE data

Ecosystem Propositions

USAGE CATEGORIES	DEC 18	Dec 19	Dec 20
Improved financial decision making	6	21	37
Increased access to advice and guidance	0	1	2
Better borrowing	7	16	21
Increased saving and investments	0	2	4
Expanded payments choice	0	12	25
Increased switching	0	0	2
Other	0	1	6
Mixed	3	9	12
Total	16	62	109

*Source: OBIE data. Chart will double-count as certain propositions cover multiple usage categories.

Pursuing its mission to enable Open Banking, the CMA – based on OBIE's work – is regularly updating its roadmap to enhance the experience of both service providers and end-users. In its latest roadmap[8], the CMA for instance announced its intention to add functionalities and items in the coming months such as:

- reverse payments (refunds): through which PISPs should be able to easily action a reverse payment to satisfy a customer's entitlement to a refund;
- sweeping: sweeping includes use cases such as being able to automatically move funds between accounts of the same beneficial owner, to earn interest, mitigate fees or borrow on less expensive terms; and
- Variable Recurring Payments.

[5] https://www.openbanking.org.uk/about-us/.
[6] Open Banking Annual Review 2020, p. 8, https://insights.openbanking.org.uk/annual-report-2020/contents/.
[7] Open Banking Annual Review 2020, p. 4, https://insights.openbanking.org.uk/annual-report-2020/contents/.
[8] Retail Banking Market Investigation Order 2017, Notice of approval of changes to the Agreed Timetable and Project Plan, 15 May 2020, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/885537/Notice_of_proposed_changes_to_the_open_banking_roadmap_-_web_publication_-_cma_gov_uk_---_May_2020_-.pdf.

In addition, OBIE started working on Premium open banking standards (also known as Premium APIs) by hosting a self-funded project outside the scope of the CMA Order and thus going beyond a regulatory initiative.[9]

Next to this initiative, the Financial Conduct Authority (FCA) published a Call for Input on Open Finance in Dec 2019. After analysing the large number of responses, the FCA concluded in March 2021 that a legislative framework would be needed for open finance to develop fully and should be completed by several key building blocks including consumer protections informed by an ethical framework, a liability model, common standards (for APIs and user experience), an implementation entity funded and governed equitably as well as digital identity.[10]

The Bank of England supports and recommends a fully interoperable API-based data sharing platform across the whole economy[11]. This includes the development of a portable credit file to give consumers access to more diverse and competitive financing options, including global trade. A data 'token' encrypted end-to-end and shared via APIs, with a built-in expiration date has also been floated as an idea to give consumers better control over shared-access to data.

A large development of Open Finance is thus on its way in the UK and will most probably benefit from the successful Open Banking experience.

Box 2: Innovative UK FinTechs leveraging open banking data

IWOCA

The fintech start up gives small businesses fast and flexible access to capital, without the upfront fees, lengthy forms and long-term commitments traditionally associated with business credit. Iwoca's risk model uses big data techniques to assess small businesses' trading data to make a quick, informed assessment of risk and what credit limit they are subsequently willing to grant, ranging from one month's revenue up to £200,000. There are no upfront fees. Iwoca charges a basic interest rate starting at two percent and increasing the longer business takes to pay.

Credit Kudos

A credit bureau using a credit scoring mechanism that takes in more current data on a person to give a fuller picture of their credit than the traditional agencies. Credit Kudos aggregates and interprets transaction data for use by lenders, brokers, and financial institutions. The service can also be white labelled by other lenders to help them onboard and approve more customers.

Mojo Mortgages

An online mortgage broker to help people borrow to buy a home. As a market broker, Mojo lets users explore mortgage deals from more than 90 lenders and then get expert advice on the best option. The company has designed MortgageScore, which combines credit and open banking data to determine if a customer is mortgage-ready. The coaching feature provides personalised advice on how users could improve their score and improve their chances of getting a mortgage.

2.3 Open Banking in Switzerland

The second Payment Services Directive (PSD2) obliges banks in Europe to open up their banking systems. In Switzerland, there is no analogous regulation and no established technological standard.

[9] Open Banking Annual Review 2020, p. 4, https://insights.openbanking.org.uk/annual-report-2020/contents/.
[10] FCA Feedback Statement, Open Finance, March 2021, §5.2.
[11] The Bank of England's Response to the Department for Business, Energy & Industrial Strategy https://www.bankofengland.co.uk/-/media/boe/files/research/the-boes-response-to-the-beis-on-the-smart-data-consultation.pdf

Thus, banks can drive and steer this development themselves. To fill this gap, the Open Banking Project initiative has been founded.

The founding body brings together several manufacturers and operators of core banking software, a bank, a university, and expertise in IT, research, and consulting. Moreover, the project itself is open to additional members as well as the Swiss NextGen API - the first API standard for Switzerland.

As the first API standard for Switzerland, the Open Banking Project launches the "Swiss NextGen API" for retrieving account information and initiating payment orders according to the specifications valid in Switzerland.

The solution is based on the open industry standard NextGenPSD2 of the European standardization initiative Berlin Group. This standard is widely used in Europe and is constantly being further developed. Building on the Swiss NextGen API, Swiss companies and especially banks can create new offers for their customers efficiently and future-proof.

Box 3: Innovative Open Banking business models in Switzerland

TWINT

The payment execution application known as TWINT allows customers to transfer money directly from person to person, to make cashless payments in stores, to conduct transactions online, and to pay securely from their own bank account or conveniently via debit from their credit card (Swiss Bankers Association, 2017). The Swiss company TWINT was created from a merger between the company of the same name and its competitor Paymit. TWINT itself was launched by Postfinance. Paymit, on the other hand, was the result of collaboration between stock exchange operator SIX AG, the major bank UBS AG and Zürcher Kantonalbank. The merger of the two providers took place in October 2016. As of September 2019, TWINT had around 1.7 million registered users making around 4 million transactions per month on average. TWINT is already a recognized payment method at virtually all major retailers, and the company is rapidly expanding (TWINT, 2019).

E-Bill

Another Swiss digital application is the E-Bill. E-Bill allows the digital verification and payment of e-bills. The recipient as well as the beneficiary of the payments are being authenticated by the bank (Swiss Bankers Association, 2017). As of April 2018, E-Bill already had over 1100 participating companies as well as 90 participating banks and 1.2 million registered users. The new infrastructure for digital bills was developed by the exchange operator SIX Group in close collaboration with Swiss banks and the financial community. Private individuals can opt to switch to e-bill by their house bank and thus receive bills in e-banking. E-Bill marks another milestone in the modernization of Swiss payment traffic, with customers benefiting from a simplified, user-friendly process. E-Bill aims to become the Swiss standard for digital bill payment (SIX, 2018).

QR Code Invoice

Another Swiss innovation is the payment slip with QR code including all the information about the payment, which links the paper-based world with the digital one (Swiss Bankers Association, 2017).

The payment section of the new bill with QR code uses the IBAN and a data code called the Swiss QR code. This code contains all the information relevant to the payment and prints additional information in a readable form. The invoice with QR code is available since 2020. The QR code invoice fulfils all regulatory important requirements related to the revised Money Laundering Ordinance.

2.4 Open Banking in Ukraine

To date, the payment and settlement systems in Ukraine is regulated by the “Payment Systems and Funds Transfer in Ukraine” (hereinafter the Law), which was adopted in 2001 and reviewed in 2012.

The Law regulates financial services related to the transfer of funds. However, the innovation affecting the financial services market, deriving from the establishment of Open Banking worldwide, has made the said directive outdated.

In line with the Association with the Association agreement with the EU, Ukraine has undertaken to implement both the PSD2 and the Directive (EU) 2009/110/EU, namely the e-Money Directive. To this end, in 2020 the Ukrainian legislator elaborated the Draft Law of Ukraine "Payment Services" №4364 (hereinafter - the draft law). Besides implementing the two above-mentioned directives, the draft law proposes to introduce several types of payment services, in addition to the two mandatory services established by the PSD2, namely account information and payment initiation services. [12]

The draft law should replace the current Law, establishing requirements for improving transparency in payment and information services, providing a clear division of responsibilities and rights for users and service payment providers, as well as defining risk management and user authentication clauses.

In February 2021, a draft Resolution on the adoption of the draft Law of Ukraine "Payment Services" was adopted. According to experts of the National Bank of Ukraine, the adoption of the Bill will allow to implement European Open Banking standards in 2022.

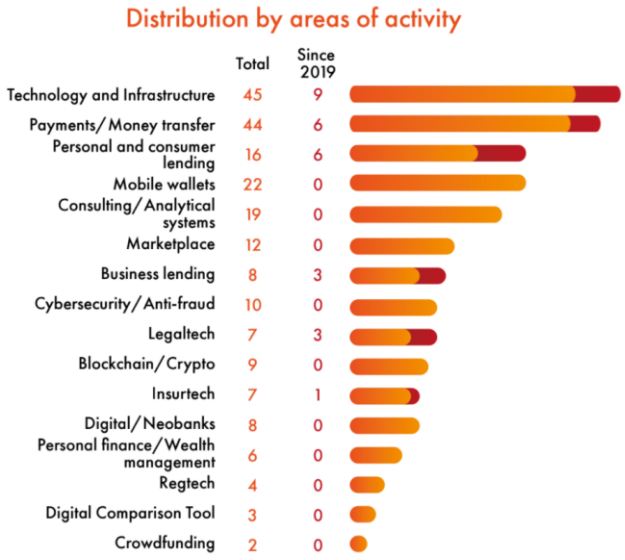
Needless to say, the goal of the Ukrainian payments regulatory framework is also to support the development of Open Banking and Fintech services in the country. At the beginning of 2018, FinTech was in its infancy and had more than 60 companies with different degree of maturity. Privatbank, the largest Fintech company in the country, was ahead of the Ukrainian and European markets. However, Fintech began to grow only in 2017 after a number of events and forums were dedicated to this topic. An important example was the Open Banking Lab project, which began in the autumn 2017 and gathered participants of the financial market, including Fintech, startups, banks, and regulators. Participants in the incubation program were selected during the hackathon in November 2017[13]. The project continued for the first three months of 2018. During this amount of time, the selected teams received trainings through lectures held by industry experts, met mentors and created projects based on Open Data from banks.

In 2018, Fintech companies were providing services as follows: payments and remittances - 32%, technology and infrastructure - 19%, lending - 14%, marketplaces - 7%, insurtech - 5%, digital and non-banks - 5%, financial management - 5%, mobile wallets - 5%, blockchain - 3%, cryptocurrencies - 2%, regtech - 2%.

In 2019, more than 100 Fintech companies were delivering functionalities in the Ukrainian market, including services related to e-banking, automation, biometric identification, machine learning and artificial intelligence, forecasting and modeling, smart cards, chatbots, blockchain, big date, digitization of all registers, IT security, cybersecurity, payment security, open API.

[12] The services are related, among the other, to cash crediting and cash withdrawal to/from users' accounts, service for the execution of payment transactions, servicing for issuing payment instruments or acquiring payment instruments, e-money payment transaction.

[13] Participants were bNnesis (service that helps banks and borrowers find a common language); ChurnAI (Artificial Intelligence Routing by CML team - the service predicts the outflow of clients from the bank and helps prevent this process); Future Agro Finance (Agro RSI - a platform for finding finances for agricultural companies; CoinyPay - a service for making payments); YouScore (FinScore - a tool for analyzing the business model and financial stability of the business); SkyService Fin (online cash desks "in the cloud", allowing you to control the receipt of funds remotely 24/7); CyberDataVizor (a cybersecurity solution); MarketBOX (a service for managing orders from several marketplaces in one interface).



In support of the development of financial technologies in 2020, the National Bank of Ukraine has developed a five-years long FinTech Development Strategy in Ukraine. Its key task is to create such a regulatory field, policies and procedures that would stimulate the growth of FinTech, including acceleration programs, international agreements, a "sandbox" for testing innovations in the loyal regulatory field, other expert consulting platforms such as the UK Financial Conduct Authority (FCA) and the Monetary Authority of Singapore (MAS).

2.5 Open Banking in Nigeria

On 17 February 2021, the Central Bank of Nigeria (CBN) issued the local Regulatory Framework for Open Banking. It aims to promote innovation, broaden the range of financial services and products available, and expand financial inclusion in Nigeria.

Open banking is one of the most important regulations to come to banking in the last decade, and it will be a gamechanger. Thanks to the CBN Framework, Nigeria will become Africa’s open banking pioneer. The important thing about the Framework is that it establishes principles for data sharing across the banking and payments ecosystem. The Framework provides for several issues, including data and API access requirements, technical design and information security specifications.

Data and services that can be shared through APIs are categorised as follows:

Category	Description
Product information and service touchpoints (PIST)	Includes product information provided by participants to their customers and access points available for customers to access services (eg, ATM/POS/agents' locations, channels (website/app) addresses, institution identifiers, service codes, fees, charges and quotes, rates, tenors, etc).
Market insight transactions (MIT)	Includes statistical data aggregated on the basis of products, service, segments, etc. It shall not be associated with any individual customer or account. This data may be exchanged at an organisational or industry level.
Personal information and financial transaction (PIFT)	Includes data at the individual customer level (eg, know-your-customer data, total number or types of account held, etc) or data on the customer's transaction (eg, balances, bills payments, loans, repayments, recurring transactions, etc).
Profile, analytics and scoring transaction (PAST)	Includes information on the customer which analyses, scores or gives an opinion (eg, credit score, income ratings etc).

The CBN intended to promote standards for the safe use and exchange of data and services, and has defined data access levels (ie, what bank data can be shared and who can obtain it). However, the successful implementation of open banking depends on the collaboration between Fintechs, banks, other Financial Institutions and the CBN.

There are some challenges with open banking, particularly around cybersecurity, data privacy and the resulting liabilities to financial institutions. Issues around data breaches, hacking, phishing scams and malware should be taken into consideration by any institution considering open banking and the use of APIs on the open Internet environment (so called "Open APIs").

Also, with the Nigeria Data Protection Regulation (NDPR), which is very close to the European Union General Data Protection Regulation (GDPR), the legal basis for processing data must be taken into consideration before the financial records of customers are shared. Direct consent must be obtained from the customer in line with the provisions of the Framework as the failure to do this could lead to severe consequences for the financial institution that shares the data.

Thanks to the open banking effort by traditional financial institutions, customers will be provided with consolidated information about all their financial products in a unique application. This would reduce time spent in carrying out transactions and minimise the paperwork for onboarding new users.

The introduction of the CBN Framework is a good development which could potentially lead to the improvement of financial services delivery in Nigeria (Source: IBA, June 2021).

2.6 Open Banking in Australia

Australia is the worldwide pioneer in the Open Banking, Finance and Data fields, based on a prescriptive approach represented by a set of rules covering several areas of citizens digital interactions, from Financial Services developing Open Banking towards other industries such as Telcos and Utility.

The development of a national Consumer Data Right - CDR (announced by the Federal Government in late 2017) provided individuals and businesses with a right to access specified data held by their businesses, and to authorize secure access to this data by accredited data recipients (e g Banks, telco providers, energy companies). In this context, the CDR, and the following Open Banking initiative, has been launched with the aim to enhance data privacy and empower citizens in having greater access, usage and control of their own data.

In contrast to active regulations of other Countries, which set up dedicated framework for specific sectors, the Australian Regulator developed a unique framework (i.e., the CDR) which is expected to be gradually implemented on a sector by sector basis, beginning with banking, energy and telecommunications, thus extending to other financial services (such as asset & wealth management, insurance) and other non financial services industries. The government is addressing de facto a real "Open Data" scenario.

Banking was the first sector to adopt the CDR, under the nomenclature "Open Banking". The objective of the mandatory data was defined in a phased approach, starting with banking account data and then including data on mortgages and end-consumer loans (Source: PwC analysis on selected countries from public data, 2021).

The Australian Competition and Consumer Commission regulates the activities of four major banks: Nab, CommBank, ANZ, and Westpac. Also, it issues accreditations for financial companies (including fintech) that decided to adopt new regulations. Open Banking's massive launch should strengthen fintechs' position against the Big Four's dominance.

2.7 Open Banking in India

Indian market represents a very particular case, which is moving towards Open Banking and beyond: to date, there is still no formal regulation, nor API standards have been defined. However, the local government is supporting a range of measures to promote competition in the banking sector. In this direction, the development of Open Banking & Finance adoption across the country has been enabled by technology and standardization initiatives along with the fact that major Banks have developed API portals in order to collaborate with Indian FinTechs.

Despite the absence of a formal regulation, Open Banking and Open Finance development in India has been boosted by different levers: among them, the relevant ones are represented by the implementation of a set of APIs through India Stack that allow governments, businesses and developers to access a technology platform via the Aadhaar national identity number system or the development of an instant real-time payment system (Unified Payment Interface) to facilitate interbank transactions.

Another relevant initiative promoted by local regulators that has boosted the country's digitalization process is represented by the Demonetization Policy (Source: PwC analysis on selected countries from public data, 2021).

2.8 Open Banking in Japan

Japan is adopting an organic approach to Open Banking. Although it is not mandatory, leading Japanese banks and financial technology (fintech) firms have started experimenting with APIs to build partnerships and participate in digital ecosystems.

In Japan, the Financial Services Agency (FSA) has established an authorisation process for TPPs, introduced an obligation for banks to publish their Open APIs policies, and encouraged banks to contract with at least one TPP by 2020. The majority of Japanese banks have taken this regulatory encouragement very seriously and were on track to fulfil the requirements (Deloitte, 2019).

Japan was among the first Asian countries to establish its own Open Banking framework. In 2015, the Japan's FSA established a consultation desk to make payments more accessible. However, the initiative was just the premise of Open Banking.

In the next couple of years, the Bank of Japan amended the Banking Act two times. In 2017, it changed the number of ownership banks must have in fintech. Next, it released a framework for regulating e-payments. In 2018, the FSA opened the Strategic Development & Management Bureau to devise a new financial services strategy with fintech as the "driving" initiative.

Japan's economy relies heavily on cash, with banks focusing on cashless transactions and digital payments. The demand for these payment types has grown rapidly due to the 2020 Tokyo Olympics, though the Japanese authorities postponed it (ReadWrite, 2021).

The measures to adopt Open Banking are versatile. Yet, the most common ones are the collaboration between national and regional partners and partnerships between banks without building API portals. Despite the scope of initiatives, many Japanese banks decided to team up once they become compliant with the new regulations. The main dispute was about the need to charge for API usage, which led to a risk of reverting to traditional screen scraping techniques.

3 A definition of Fintech

The term 'Fintech' has broken out of the confines that a few people used to enter, becoming a phenomenon that has a real impact on people's private and working lives.

Today, there is no globally recognised definition of the word "Fintech". Fintech represents the beginning of digital technologies that are changing the financial market, innovating it in a significant way from the developers and service providers points of the view. In the financial sector, there are countries that are more inclined to innovation and others, such as Italy, which have always been anchored to elements such as family savings, bank credit, and small and medium-sized enterprises (SMEs).

Thus far, Fintech companies have invested in all countries. The largest majority of people (especially youngsters) use at least one Fintech or Insurtech service, receiving functionalities that are generally perceived as very satisfactory.

The Fintech world is constantly and continuously changing the habits of consumers and businesses in many countries, influencing the choices that are made in the financial and insurance fields.

The feature that is most often considered positive is represented by the total disintermediation of the banking world that, favoured by new technologies, is making possible the phenomenon of Open Banking. The spread of Fintech solutions within the background of Open Banking has fostered the creation of new services including, easier online payments, the management of separate accounts on a single dashboard, and more timely financing management, just to make a few examples.

To better understand why Fintech is so relevant, two macro categories of functionalities can be identified:

1) services that **existed before** the advent of fintech, such as foreign currencies payment management, which can now be provided more efficiently and at lower costs.
2) services **born after** the arrival of Fintech technologies that have allowed the emergence of new services that were previously impossible to create, due to the lack of the necessary technology, which in this case has been a key enabling factor.

4 What is Open Finance? The main characteristics of the economic paradigm

According to the United Kingdom (UK) Financial Conduct Authority, Open Finance is "the extension of open banking-like data sharing and third-party access to a wider range of financial sectors and products." [14]

Today, the provision of financial services is not anymore only a prerogative of traditional Financial Institutions (FIs). Over the last years, new players have emerged in financial markets, eroding incumbent banks' market shares, and increasing the overall level of competition.[15] Examples of new players are constituted by large technology companies (Big Tech), Fintech enterprises, and challenger banks.

Interestingly to note, financial services offered by incumbent and new Payment Service Providers (PSPs) do not only refer to traditional payment and bank accounts functionalities. By taking advantage of the opportunities stemming from the application of advanced technologies – Application Programming Interfaces (API), Blockchain and Distributed Ledger Technology (DLT), Artificial Intelligence (AI) and Machine Learning (ML) – PSPs have developed innovative financial and insurance products to single out their supply and give light to cost-efficient business models.

Against this background, both traditional and innovative players have developed new type of partnership.

On the one hand, Fintech companies have been able over time to realize agile and customized micro-services oriented to meet customers' expectations and needs. Therefore, banks have undergone the pressure to upgrade their business models to maintain a high degree of competitiveness in the financial arena to avoid losing market shares.

On the other hand, both traditional and new PSPs have started understanding the value of cooperation.[16] Banks have perceived the opportunity to turn themselves into a marketplace, providing their clients with cutting-edge functionalities realized by Fintech companies. On their side, Fintech have figured out that cooperating with banks would have allowed them to reach to a large set of clients. Taking into account the mutual benefits deriving from cooperation, banks are Fintech have strengthened their partnerships.

Far from being a consolidated strategy, traditional and new players will need to foster this trend in the forthcoming years, thus giving light to innovative business models and enhancing the benefits for the whole Open Finance ecosystem.

Before elucidating some Open Finance use cases, the document will shed light on the definition of Fintech and some Open Banking country experiences, focusing on the European area.

5 Open Finance Use Cases to support trade worldwide

Within the Open Finance landscape, new technologies are enabling the spread of businesses characterized by low marginal costs and innovative use cases. Incumbent and new players have been working to develop services to meet corporate and retail customers' expectations.

[14] Financial Conduct Authority, "Call for Input: Open Finance" December 2019, p. 3
[15] Giorgio Barba Navaretti, Giacomo Calzolari, Alberto Franco Pozzolo, "FinTech and Banks: Friends or Foes?", European Economy, 2017-2
[16] Ernest Young, Unleashing the potential of FinTech in banking, 2019

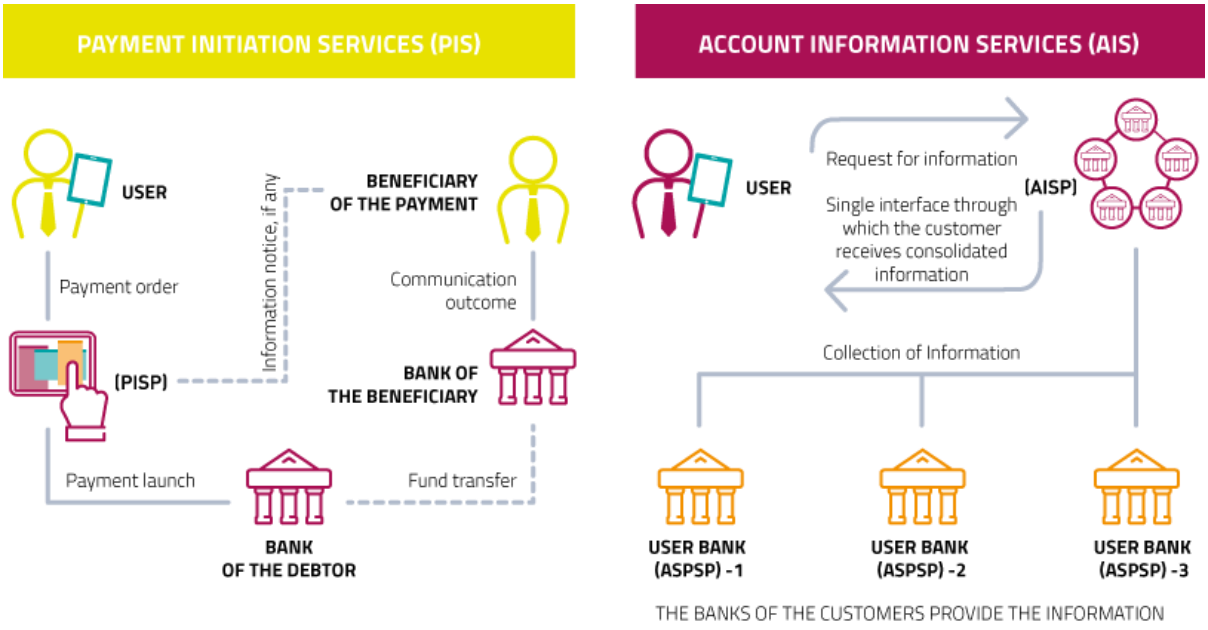
5.1 Account Information and Payment Initiation Services

In Europe, the PSD2 gave light to Account Information Services (AIS) and Payment Initiation Services (PIS). According to said piece of legislation, "Member States shall ensure that a payer has the right to make use of payment initiation service provider to obtain payment services". [17] Similarly, "Member States shall ensure that a payment service user has the right to make use of services enabling access to account information." [18]

The UK Financial Conduct Authority (FCA) describes AIS as "online services which provide consolidated information on payment accounts held by a payment service user with payment service providers." The same organization refers to a PIS as "an online service which assess a user's payment account to initiate a transfer of funds on their behalf with the user's consent and authentication." [19]

Interestingly to note, the directive explicitly affirms that both services are applicable only for online payment accounts. The PSD2 makes it clear that, when dealing with AISP and PISP, ASPSPs are requested to apply Strong Customer Authentication (SCA) principles to guarantee the security of electronic transactions.

Box 4: Workflow of Account Information and Payment Initiation Services



Both AIS and PIS can be used to support trade operations on a global scale. On the one hand, PIS can facilitate payment operations, providing a smart option to those economic parties involved in the international supply chain, reducing manual errors, and streamlining online transactions. On the other hand, AIS can facilitate trade parties to have an accurate overview of their online banking accounts. This option could be extremely relevant especially for those multi-banking companies, that refer to

[17] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directive 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC, art 66

[18] Directive (EU) 2015/2366 of the European Parliament and of the Council of 25 November 2015 on payment services in the internal market, amending Directive 2002/65/EC, 2009/110/EC and 2013/36/EU and Regulation (EU) No 1093/2010, and repealing Directive 2007/64/EC, art 67

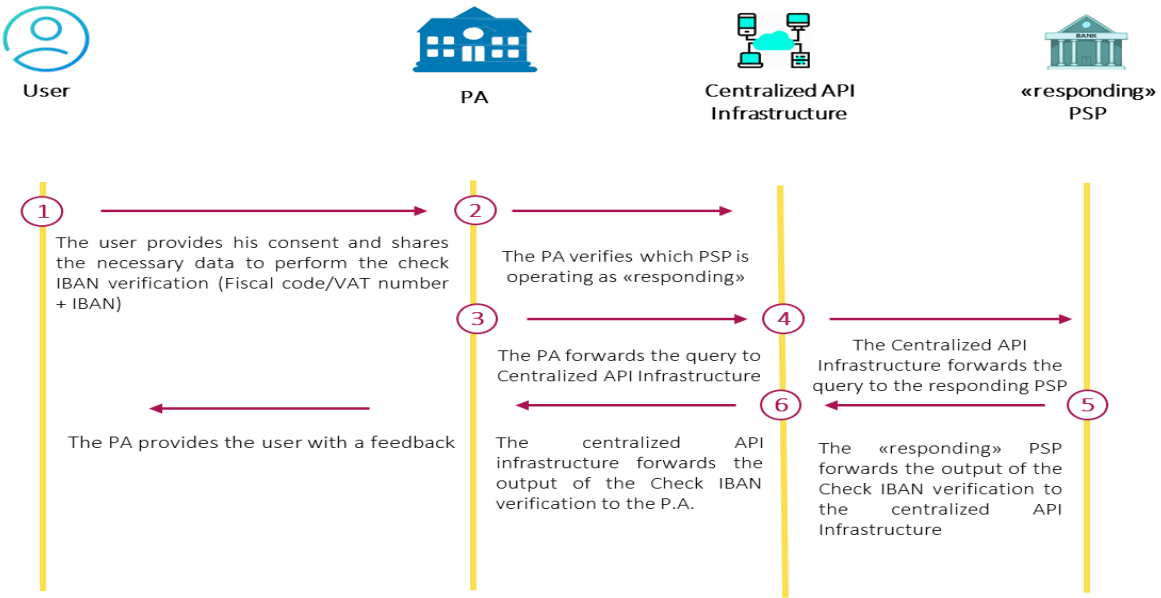
[19] https://www.fca.org.uk/account-information-service-ais-payment-initiation-service-pis#:~:text=Under%20PSD2%2C%20a%20'payment%20initiation,credit%20card%20or%20debit%20card.

different Account Servicing Payment Service Providers (ASPSPs) to benefit from their banking and financial services.

5.2 Check IBAN

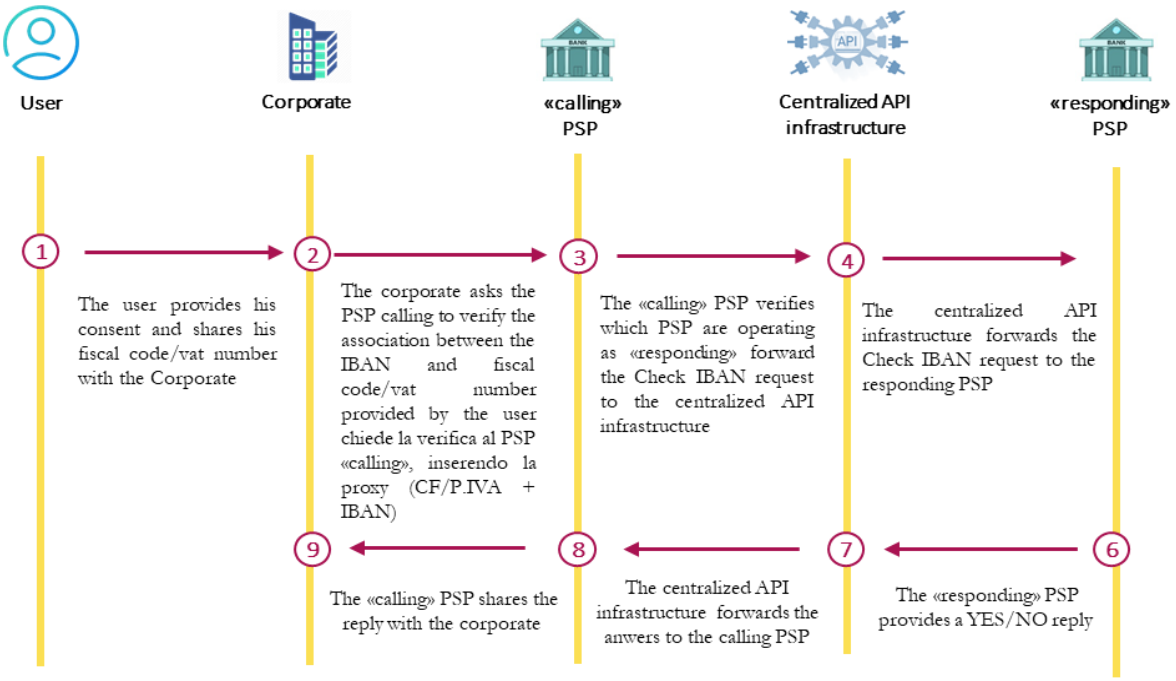
The Check IBAN is a value-added service (VAS), which aims to enhance financial market efficiency as well as finance security. After having received the consent from their customers, PSPs are enabled to offer this service to the Public Administration and the private sector. Before authorizing the transfer of values to the account of final user (being the latter either a physical or a legal entity), public governments and corporates are enabled to check real-time the correctness of the association between the IBAN code and the fiscal code or vat number provided by a final user.

Box 5: Workflow of the Check IBAN service for the P.A.



When the PA asks for Check IBAN verification, banks can only perform the role of responding agent. The PA operates as the calling agent, issuing the Check IBAN request and forwarding it to a centralized API platform, that routes the query to the responding PSP. The latter controls whether the IBAN code of the user matches with his/her fiscal code or vat number. The responding PSP forwards the outcome of its analysis to the centralized API platform, which routes it back to the PA.

Box 6: Workflow of the Check IBAN service for corporates



The second scenario foresees the involvement of corporates in the place of the PA. In this case, bank and non-bank PSPs are enabled to perform both the role of calling and responding agents. Corporates can request Check IBAN verifications to ensure the correctness of the data provided by customers that are willing to subscribe a service offered by the concerned corporate.

Following the Check IBAN request made by the corporate, the FIs performing the role of calling agent deal with the centralized API infrastructure. The latter routes the request to the PSP operating as responding agent. The responding agent performs the verification and shares the output with the centralized API infrastructure, which routes it back to the calling agent. The latter informs the corporate about the outcome of the Check IBAN analysis.

In both workflows, the API gateway covers a pivotal role. By mapping the end points (bank and non-bank PSP) participating in the service, it routes the requests deriving from calling entities to responding agents, ensuring a seamless and secure data flow among the parties involved in a Check IBAN transaction. To do so, the API gateway defines common guidelines, technical specifications, and a structured taxonomy that players involved in this data supply chain (being both the Public Administrations and corporates) have to adopt to guarantee the interoperability of the service.

In Italy, this functionality was realized by CBI and implemented in July 2020 to support the Public Administration to correctly deliver fiscal bonuses to people and enterprises affected by the Covid-19 crisis. Until December 2021, the Check IBAN service performed about 7 millions checks, thus providing the Public Administration with a solid anti-fraud and confirmation tool. These figures have been eased by the adoption by the government of a few policies to facilitate the digitalization of payments. These include, for example, the cashback program, which enables consumers to get back a maximum of 10% of expenditures made through online payments and credit/debit cards for transactions up to the limit of 1.500 euros. CBI is now proceeding with onboarding operations to enable corporates to take part in the service.

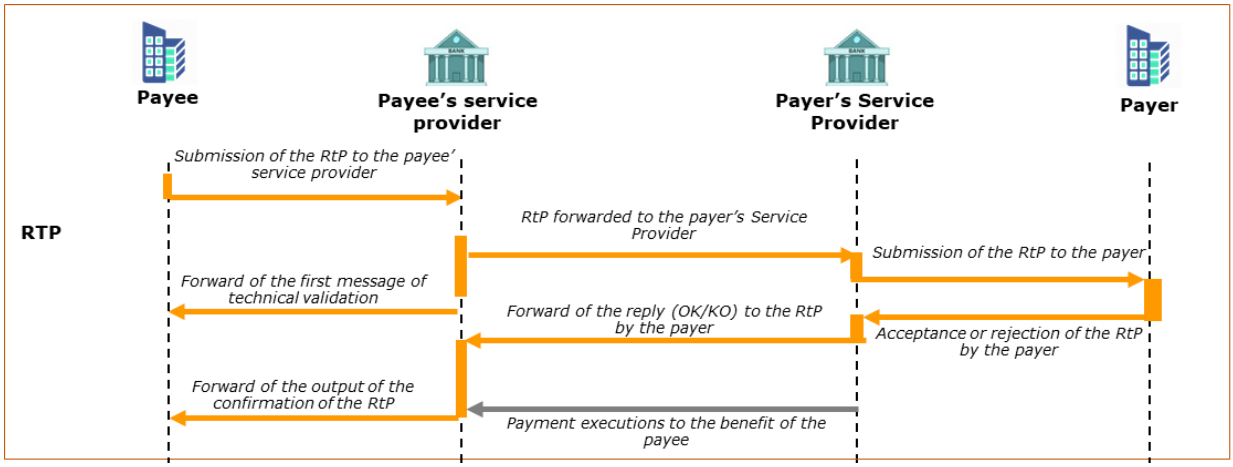
Using anti-fraud services, such as the Check IBAN, could facilitate trade operations worldwide. Since trade operators may find themselves in the situation of ignoring their counterparts, having a functionality that checks real-time the correct association of internationally recognized data, such as

the IBAN and the vat number, could reduce the risks of import and export operations, thus increasing trust in international trade.

5.3 Request to Pay

According to the European Payment Council (EPC), the Request to Pay (RtP) is a "messaging functionality. It is not a payment means or a payment instrument, but a way to request a payment initiation." [20] The RtP covers the set of operating rules and technical elements (including messages) that allow a Payee to request the initiation of a payment from a Payer in a wide range of physical or online use cases.

The scheme of the RtP foresees the involvement of a few actors, namely the payee and the payer and their respective PSPs. The Payee submits the RtP. By consulting an API directory, the Payee's PSP forwards the request to the PSP of the payer. The latter informs the payers about the RtP. At this stage, the payer decides whether to accept or reject the RtP. Its reply is forwarded by the payer's PSP to the payee's PSP, which informs its customers about the outcome of the request. Interesting to note, API are always used in the exchange of financial messages between PSPs.



The RtP can be used for person-to-person (P2P), Business-to-Business (B2B), Business-to-Government (B2G) or Government to Business (G2B) payments, alongside for e-invoice presentment and payment services (EIPP). The scheme of the RtP is based on the possibility to be used both for credit transfer and instant credit transfers.

The reason for underlining the importance of this aspect scheme lies in the possibility to ensure automatic reconciliations of payments. In doing so, the RtP reduces the possibility of errors deriving from manual procedures and increases the speed of payments, thus facilitating payment operations at the international level.

5.4 The Legal Entity Identifier (LEI)

In 2014, the Financial Stability Board (FSB) gave light to the Global Legal Entity Identifier Foundation (GLEIF) to uphold the implementation of the ISO 17442 standard - the Legal Entity Identifier (LEI) - worldwide. The LEI code serves to uniquely identify legal entities that are involved in financial transactions. Several regulations around the world impose the use of the LEI to those entities that trade over-the-counter derivates and securities.

[20] European Payment Council, SEPA Request-to-Pay Scheme Rulebook, EPCO14-20, 2 June 2020, p. 7

Going beyond compliance, the LEI could be used by banks to facilitate Know Your Customer (KYC) functionalities. Nowadays, entities obtain a LEI when onboarded by a FI. However, the traditional process for obtaining such a code is to refer to a Local Operating Unit (LOU), namely a federated company of the Global Legal Entity Identifier System (GLEIS), which is as an organization entitled to issue an LEI code.

When onboarding a legal entity, both FIs and LEI issuers may request the legal entities to provide information related to their legal status and ownership structure. This scenario may entail a duplication of work.

In order to streamline the process, the GLEIF has launched a project known as Validation Agent Network, which allows FI to perform the role of validation agent. The Validation Agent Network can be described as an "operational model in the Global LEI System, which allows FIs to obtain and maintain the LEI for their clients in cooperation with accredited LEI Issuer Organizations by leveraging their business as usual client identification procedures in KYC and client onboarding processes."[21]

Through this project, FIs may control whether the legal entity wishing to onboard is equipped with an LEI code. If not, the FI checks a series of data related to the legal status and ownership structure of the company. It remains a task of the LOU to issue the LEI in compliance with the ISO 17442 standard.

Within the context of LEI issuance, communication between FI and LOUs can be enabled by APIs, thus streamlining data flows. Besides improving customers' experience, this framework enables the digitization of onboarding processes, which are thus based on standardized legal entity data. The scheme also allows enhanced internal data management processes, enabling a reduction of overall costs.

The use of the LEI code in trade operations could enhance the quality of data exchange at the international level, besides making the procedures of know your customer and know your supplier easier. According to the GLEIF, "all businesses within the supply chain could reduce operational risk by using the LEI of trading partners to reduce the onboarding and maintenance costs of customers and suppliers."[22]

5.5 Trade Finance

As a part of the project to identify hurdles to achieve full digitization of documents that are part of a trade transaction, aiming to meet international trade regulations, the dematerialization of documents issued by third parties (other than economic operators interested in the operation) represents a priority. The case of the Certificate of Origin to operate on foreign markets it is necessary to carry out more complex assessments and consider factors very often unrelated to the domestic practices. Amongst the various documents that compose a cross-border transaction, we will cover "Bill of Lading" which has to be considered for its qualification as a "document of title" and its "dematerialization".

We realize that the fulcrum of the payment operations tending to give a certain guarantee on the delivery of the goods are the transport documents and first of all the Bill of Lading, especially in the context of negotiations of Letter of Credit.

As a B/L, we are referring exclusively to sea transport which still today represents more than 80 percent of global transport.

[21] GLEIF, "Introducing the LEI Validation Agent Framework. A new role in the Global LEI System enabling financial institutions to simplify and accelerated LEI issuance", 2020
[22] GLEIF, Global Legal Entity Identifier Foundation, Annual Report 2019, p. 16

The Bill of Lading is considered worldwide a representative credit title of the “goods” transported. B/L incorporates the right to return the “goods”, therefore the sender of the goods and the recipient are replaced by “the one that holds the goods” i.e., the holder: it is the possession of the title that gives ownership of the related rights.

The doctrine has tried to fill this gap by defining the document, (i.e. the B/L) as "something representative of a juridically relevant fact". For the sake of clarity, it is also necessary to record contrary opinions based on the fact that the "representativeness" does not come from the document but is the result of a logical operation carried out by the subject who takes the matter into consideration in order to verify his own judgment.

So, it is not in the document, but in the judgment of those who take it as a means of proof.

Normally, the definition "document" is accompanied by the use of paper, the physical form of the instrument, in fact, the centuries-old use of paper to draw up documents has led to full and complete identification of the "document" with the paper. It is therefore easy to understand why the concept of "document" ended up identifying itself with that of "paper".

The pandemic crisis “Covid 19” has led to a significant expansion of the concept of "document", thus underlining that paper support cannot be an indispensable element to recognize the qualification of "document" to any representation of reality.

Starting from this basis, it can be assumed that the dematerialization of documents in general is already overwhelmingly underway, while several problems are still encountered when it comes to dematerialization or digitization of the Bill of Lading.

This is undoubtedly the topic that will thrill us for the months ahead.

Studies regarding the dematerialization of documents are dated 1997. In recent years various platforms have been developed. One of the most known being the one of DCSA which published in early December 2020 the data and process standards for the presentation of the shipping instructions and the issuance of the bill of lading (B /L). DCSA B / L standards are aligned with the UN / CEFACT (United Nations Centre for Trade Facilitation and Electronic Business) multimodal transport reference data model to ensure a global industrial framework that accelerates digitization through a unified industry effort. In this regard, we also recalled that UNCITRAL Model Law on Electronic Transferable Records, that the various countries will be able to use to make it possible to trade such digital securities. Unfortunately, up to now few countries have taken this path, while others, almost all the European ones have joined and have shown interest to really adopt it, but we still must wait.

We believe that digital acceptance of B/L may only occur if legislator will discipline the matter to assure "certainty" to the confidentiality of the data which, accompanied by a certain saving in terms of time and money, could lead to the definitive "take off" of the desired digitization phase of this document which also in the future era it will be the point of reference for transport and for the “monetization” of revenues as the Bill of Lading is always the trait-d 'union with the Letter of Credit instrument.

Nowadays, we have to look very carefully at the use of the blockchain for the management of operations between the various players in the international trade chain such as: shipping, air, customs, port authorities and others.

The financial part of the operation will also have to be integrated with the banking system which will have to be a leading actor for the definitive development of this new era.

Amongst few other, the first document to be made completely digital and not "dematerialized" is the Bill of lading.

Unfortunately, to date we record in the opinion of the writer that the most critical point is the lack of a single central storage point for control keys or other tools that can allow to transfer the Bill of Lading

with a cryptographic key and not with the handling of the paper document. At the same time, it will be necessary to intervene on the different national law regulation in order to change the current stance which see only the charter known as the object of transfer for what concerns the Bill of Lading. In this regard, it is necessary to recall the qualification as document of title of the Bill of lading that we have talked about in another part of this contribution.

There is an obligation to inform that the ICC itself is doing a great job to find a solution to the problem and achieve full digitization of documents and we hope that soon we can have a single operational and legal context.

5.6 Buy Now Pay Later

Open Banking access to account interfaces is already supporting PIS, which are compulsory services in Europe under the PSD2 for different types of payments, including bulk payments and SEPA credit transfers. However, the growth of e-commerce and online digital payments is driving the market to ask for more flexible payments options.

Therefore, FIs are developing a new operational model, called Buy Now Pay Later, for which a buyer can ask his ASPSP or other PSP for a micro-loan as a part of a full payment. In a Business to Customer (B2C) scenario, the ASPSP can grant an immediate loan to its Payment Service User (PSU), defining with the client a repayment schedule based on defined competitive conditions (e.g. interest rate, frequency of the rate, the length of the financing plan, etc.). This type of functionality could be further incentivized by the use of API, which allows a real-time sharing of loan conditions and authorizations between the ASPSP and the final user, thus improving the user experience of customers and merchants.

Buy Now Pay Later can support users looking for a loan for their purchases to pay in instalments without a credit card and directly through their bank account. The service has important consequences for merchants and customers (both online and physical) also in terms of churn rates and conversion rates. Users are more inclined in making some purchases even if without credit cards or liquidity on their accounts. Of course, this service could affect – both in negative and positive way - also the spending power of final users, which have to utilize this service carefully in order to avoid exceeding their solvency capacities. Credit worthiness checks may be performed by those service providers offering this functionality, even via API and thanks to the informative flows exchanged through Third Parties (e.g. info provider, credit scoring agencies, etc.) whose predictive ratings are improved thanks Open Banking functionalities (e.g. checks on transactions' list). The more the user is "trusted" through algorithm which point to the solvency history, the more he can spend thanks to higher spending limits.

Overall, the Buy Now Pay Later functionality may be used by PSPs as a short-term financing option to facilitate payments operations within the supply chain. It could support SMEs that lack funds to face international competition and do their business beyond national borders.

5.7 Public Administration Certificates

The Organization for Economic Cooperation and Development (OECD) defines open government as the opening up of government processes, proceedings, documents, and data for public scrutiny and involvement.[23] Therefore, the expression Open (Government) Data refers to the information collected, produced, or paid for by public bodies and made freely available for the re-use of any purpose.

[23] OECD (2016), Open Government: The Global Context and the Way Forward, OECD Publishing, Paris, https://doi.org/10.1787/9789264268104-en.

Open Data enables cross-sectors data sharing, which can lead to various advantages. It allows the public sector to benefit from accurate spending reviews to avoid unnecessary costs, enhance efficiency and transparency. On the other hand, Open Data incentivizes the private sector to give light to innovative services and business models, thanks to the large set of available information (including citizens' habits and behaviours towards the public administration).

To ensure the achievement of the benefits stemming from the application of Open Data, the Public Administration could play a pivotal role. Through a digital interface, for example, public governments could provide final users with the main documents related to their personal information, such as registry certificates. In doing, public governments can cooperate with the private sector. Certificates, personal data, health attestations could be requested to a public government from a final user through his internet banking or payment application enabling new use cases together with cross selling opportunities. These types of opportunities are even more feasible nowadays with the application of advanced technologies (e.g. API and Cloud computing) and the establishment of the Open Banking paradigm on a global scale. Therefore, the Public Administration could become a pioneering data sharing agent capable to provide citizens with relevant information, thus improving the efficiency of public and private processes.

5.8 Instant insurance services

The insurance sector is undergoing a deep transformation, as players are reviewing their offering to meet new customers' needs, prioritize their investments on digital and instant services and rationalize costs.

To do so, Insurance companies are promoting innovation by partnering with other players, including technology providers and InsurTech companies. This possibility is due to the establishment of innovative economic paradigms, including Open Finance and Open Data, in which data are considered the new fuel for ensuring economic growth, improving risk management activities, and designing innovative services.

In this scenario, the Internet of Things (IoT) and 5G technologies are two elements supporting the spread of innovative insurance functionalities on the market. The Internet of Things is enabling insurance companies to offer "pay per use" agreements for end users' vehicles.

Open Banking allows insurance companies to benefit from the opportunities to use financial data to improve risk evaluation and find out business opportunities. Technologies such as API allow smooth and easy integration of insurance services in Banking and financial applications, enabling both an improvement of FI's supply and user's experience.

Against this background, insurance players have been working to deliver cutting-edge products, including Instant Insurance and Micro-insurances. These products allow companies to respond to their customers' needs in the precise moment in which the need arises and for the limited period of time related to the client's needs. These economic models are particularly effective as they perfectly adapt to the changing needs and habits costumers, including the increasing propensity for instant and modular products and services that do not bind them to a particular provider but leave the freedom to choose among a variety of suppliers.

Transitioning to Open Insurance by allowing consumers to share their data with third parties will foster data mobility and the growth of platform ecosystems. Thus, incumbents will be able to tap new technologies, experiment, and upgrade processes to match consumer expectations. While Open Banking has taken center stage at regulatory level, global industry led initiatives[24] are working to formulate common data standards and open API specifications. However, it is interesting to note

[24] The Open Insurance Initiative

increasing interest by regulators. The Financial Conduct Authority (FCA)[25] and the European Insurance and Occupational Pension Authority (EIOPA)[26] have both released public consultations to explore the opportunities of extending Open Banking frameworks.

These new proposals represent a potential win-win solution for insurance companies and policyholders: among the benefits, it is possible to identify a reduction in the timing associated with the underwriting phase and an increase in the level of transparency. All the benefits concern the capability of insurance companies to adapt their models to the new technological trends. Rapid answers could be effectively provided only with the right tech management. This is why, over the last two years, several insurance companies have started to make important IT infrastructural changes, even signing strategic partnerships with key tech players.

5.9 Risk rating service

Today, risk management and other activities related to analytics have a pivotal role within the Open Finance landscape. Final users and Third Parties can benefit from the exchange of dispositive and informative data with FIs. Different TPPs operate as Information Providers, with the aim to enhance credit scoring tools and software to take full advantage of the potentiality stemming from Open Banking.

In the PSD2 scenario, after having obtained the consent by the final user, TPPs are able to access to payments' data related to transaction lists, account owners, account lists, and disposable incomes. This type of information could be very useful in defining the credit scoring of the costumer. Moreover, recurring consents given by the final users allow Third Parties to periodically get relevant information to perform predictive analysis.

Personal Financial Management (PFM) and Business Financial Management (BFM) functionalities are offered by many Third Parties, that have never directly offered financial services before. These information providers are entering into the Open Finance market with personalized financial tools to offer innovative services to their clients (including, digital identity services and wallets), and improve the knowledge of customers' spending habits.

Information Providers are among the players that are benefitting the most from the Open Banking scenario, thanks to the opportunity ensured by API to perform real-time checks over final users' credit scoring. By virtue of advanced technologies, such kind of checks can be easily integrated as micro-services in more complex and structured products, such as the Buy now pay later.

5.10 Securitisation

When we talk about securitisation, we are unfortunately led to think of the problems that accompanied a phase that was certainly not a happy one for this form of financing and an equally critical phase for the world of banking and economics. Our thoughts turn to the year 2008, which, certainly not by chance, is also the year in which Satoshi Nakamoto's white paper was published and the Blockchain project came to life.

The challenge for those working on digital innovation in the financial world is also to overcome deep-rooted prejudices and to overcome them by leveraging a theme that is the cornerstone of any economic and financial activity, namely trust. And when it comes to "building" and guaranteeing trust, it is once again no coincidence that it is the blockchain that can open new perspectives and new models. These considerations have given rise to platforms that allow access to this form of financing, even for those who have never considered it and those who could not, to increase the effectiveness

[25] FCA publishes feedback to Call for Input on open finance
[26] EIOPA consults on open insurance

of financial services with new and simplify the means of access to credit while increasing reliability, transparency and security.

The two basic characteristics of securitisation are:

- the operational difficulties,
- the need to provide the transparency requirements demanded by both investors and regulators, to protect the market.

The most interesting models for the market are those of the end-to-end platforms, i.e., those that follow the process from the origin, through:

- management of the original asset (e.g., invoices issued to the Public Administration),
- onboarding managed with digital and regulated KYC and AML processes, for assets in portfolio,
- conversion and transformation into tokens,
- provision of information on the tokenized asset and its performance.

In this way, both the invoices and the bonds they are collateral for will have their own digital representation on the Blockchain.

With the transfer of ownership with an ad hoc procedure of issuing securities, a security token can also be associated which is paired "one-to-one" with the original asset, represented by the basket of invoices. This token facilitates trading & settlement and allows the asset to be placed on the market, thus allowing its value to be exploited.

The blockchain with its notarization feature allows to provide accurate reporting in real time of what is happening, also addressing the issue of transparency.

New models that the technology enables can provide all the guarantees on the performance of the asset's life cycle, a workflow that simplifies securitisation operations based on the provision of collateral, and finally making data available to the market to attract new funding.

An important feature is also represented by the compliance on the identity of the subjects, to have certainty of the interlocutor thus favouring the trust of the subjects that operate in it and that falls within the characteristics of the necessary digital trust services, which in Europe have been introduced by the EiDAS Regulation.

The market also needs transactions that are as real-time as possible, not only for the confidentiality of the information changed, but also to ensure that transactions do not run the risk of suffering Denail of Service (DoS) attacks.

In concrete terms, the blockchain offers the possibility of having a technology on which to record performance data and assets and their management, including their transfer. In fact, the blockchain makes it possible to considerably reduce the operations of intermediaries to facilitate the exchange of asset ownership. With blockchain, one can innovate the industry by making services available about token exchange possibilities, even if the company does not issue a public securitisation, and this favours SMEs.

Making available a periodic audit on each operator, updating over time also the performance of its assets would increase the level of investor awareness because they can have the "history" in terms of the value of the underlying assets of that individual subject. Without the technology available today, it was not possible to provide detailed tracking of the performance of the underlying assets and a real-time view of the history of the performance generated by the assets.

All this is possible, constituting an important enabling factor, if products and solutions are made available that provide virtual desks with all the data related to the securitised assets, as well as the

integration of the data with different systems tracking the performance of the assets. Only in this way can securitisation be a powerful technological tool that serves the real economy by drastically reducing the time it takes to access liquidity.

The Blockchain and the solutions described above could also make it possible to deal with the next wave of NPLs (Non-Performing Loans), exploiting the potential of other technologies such as cloud storage and artificial intelligence to digitalise the entire process of negotiating and selling non-performing loans (also as part of securitisation operations), giving a concrete boost to the standardisation of processes, thus encouraging the creation of a transparent, liquid and efficient secondary credit market. Thanks to a system of smart contracts, credit can be tokenized and easily transferred quickly. Each credit will have a permanent data room in which all the related data and documents will be stored, which will obtain a certain date and incorruptibility thanks to blockchain technology.

6 Conclusions: suggestions for policymakers and decision-makers

Far from being a comprehensive analysis on Open Banking and Open Finance, this White Paper aimed at highlighting the main characteristics of these innovative paradigms and shed light on a few use cases that could support trade on a global scale. The services investigated in this document have a focus on the payments sector, which has a crucial relevance for the conclusion of trade-related operations.

Therefore, policymakers and decision-makers are suggested to take closely into account the evolution characterizing this domain and more generally the financial services market.

Open Finance services provide an added value as they are able to gather data belonging to different industries, thus enriching the overall level of information to be displayed throughout the supply chain. This aspect increases the quality of data and reduces human errors. Furthermore, the possibility to use advanced technologies increases the speed of services, which can occur on a real-time basis. This element improves the customer and user experience, facilitating the possibility to make payments all along the supply chain and reducing the time necessary for each operation. Data sharing is the key for delivery of new services, but the privacy constraints and the risk of cyber security have to be taken well into account by all the service providers, in the view of protecting customers that can access these new experiences.

Against this background, the activities performed by national and international legislators, alongside that of standard setter bodies, is of paramount importance to foster the degree of interoperability of these services at the global level. To this end, the suggestion of the UN/CEFACT Finance and Payment domain to legislators and policy makers is to ensure the application of the level playing field principle, for which same activities and risks are addressed by same rules. This scenario would lead also non-financial players (e.g. Telcos, public administration, automotive, pharmaceutical companies) interested to take part in the payments sector to share data, thus incentivizing a shift of paradigm from Open Finance to Open Data. Finally, by supporting the uptake of Open Finance services, policymakers and decision-makers could boost trade facilitation and electronic business, contributing to the development of a solid and safe digital economy.

6.1 List of Acronyms

AI	Artificial Intelligence
AIS	Account Information Service
AISP	Account Information Service Provider
API	Application Programming Interface
ASPSP	Account Servicing Payment Service Provider
B2B	Business-to-Business
B2G	Business-to-Government
BFM	Business Financial Management
CSC	Common and Secure Communication
DLT	Distributed Ledger Technology
EIPP	e-Invoice Presentment and Payment
FI	Financial Intermediary Institution
G2B	Government to Business
LEI	Legal Entity Identifier
ML	Machine Learning
OECD	Organization for Economic Cooperation and Development
P2P	Person-to-Person
PA	Public Administration
PFM	Personal Financial Management
PIS	Payment Initiation Service
PISP	Payment Initiation Service Provider
PSD	Payment Service Directive
PSD2	Payment Service Directive 2
PSP	Payment Service Provider
PSU	Payment Service User
RtP	Request to Pay
RTS	Regulatory Technical Standards
SCA	Strong Customer Authentication
SCT Inst	SEPA Credit Transfer Instant
SCT	SEPA Credit Transfer
SEPA	Single Euro Payments Area
SME	Small and Medium Enterprises
TPP	Third Party Provider
TSP	Technical Service Provider
UK	United Kingdom
VAS	Value-Added Service
VAT	Value-Added Tax

6.2 References

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