

Global Open Banking Landscape

June 2020



Summary

IBM Industry Academy



Insightful, inspired innovation.

The Initiative:

- Joint initiative by IBM Academy of Technology and IBM Industry Academy to analyze approach to open banking by countries around the world
- Key topics include regulatory / industry led, technical standards, use cases and adoption levels by financial institutions, third parties and consumers, and IBM opportunities*

Key Outcomes:

- 81 participants from 20+ countries, across IBM brands
- Report covers 18 countries in 5 continents
- Consolidated view - executive summary, opportunities and prioritization matrix, use cases, technical reference architecture, and recommendations*
- Being used to support opportunities worldwide

* Not included in external distribution of the report

Contents

Introduction to Open Banking		
Executive Summary	<u>4</u>	
Map of Regions	<u>5</u>	
Open Banking opportunities & prioritization matrix	<u>6</u>	
Detailed Use Cases	<u>7</u>	
How they Compare	<u>9</u>	
Open Banking Reference Architecture	<u>10</u>	
IBM Global Banking Recommendations*		
Asia		
China	<u>13</u>	
India	<u>19</u>	
Japan	<u>32</u>	
Singapore	<u>44</u>	
Sri Lanka	<u>47</u>	
Oceania		
Australia	<u>49</u>	
New Zealand	<u>55</u>	
Americas		
United States		<u>59</u>
Canada		<u>66</u>
Brazil		<u>69</u>
Europe		
United Kingdom		<u>75</u>
Spain		<u>80</u>
Italy		<u>86</u>
Ireland		<u>87</u>
France		<u>88</u>
Germany, Austria, Switzerland (DACH)		<u>91</u>
Middle East		
Turkey		<u>97</u>
United Arab Emirates		<u>101</u>
Contributors		<u>106</u>

Executive Summary

OPEN BANKING: REGULATION DRIVING INNOVATION

Open banking is a strong force of innovation in an industry that is under enormous pressures from customers, regulators and FinTech innovators. Trends of multi-channel, omni-channel and platform banking are paving the way for banks to adopt open banking standards. With Open Banking / PSD2, the regulators around the world are opening the industry – allowing access to consumers' data to third-party service providers. Very often these service providers are startups and online financial service vendors. The consent to share data comes from consumers. With the consent, FinTechs can then use the shared data and data via open APIs. The purpose of this exercise is that the regulators want to level the playing field and create competition that drives innovation and ultimately value for the customer.

COLLABORATION RATHER THAN COMPETITION

The creation of innovative networks that provide access to open APIs comes in a time when open source software, co-creation and co-development, and cloud computing form the future of infrastructure and application design. Cloud native development via open source software and the use of shared programming assets in GitHub repositories accelerate development time by at least 30%. The fact that developers share assets and methodologies freely provides quicker time to market and richer functionality. Banks like BBVA, Citigroup, and Capital One started in 2016 with their developer marketplaces to support the sharing economy around API development. Developers, creators, and users of APIs and open banking assets is because everyone gains something. Creators and consumers of APIs find new ways to find value for themselves and their development processes by embracing modular and standardized development frameworks. And they find ways to build on each other and thus create new innovative services and programming assets that can be leveraged by the community to create value for the end-users.

The method of development is agile, and the result is unprecedented development speed. The collaboration among developers focuses on openness and speed and on monetization of assets that are created in the process of exchanging value among the participants. The winners in this sharing economy are speedy and innovative developers who can easily and quickly distribute their APIs and find ways to monetize them.

The operating model for open banking is the marketplace of platform model where snippets of code or microservices applications are shared and improved upon a community of developers. The programs and functions of this speedy innovation are shared with regulators and banking professionals inside and outside the bank and thus hardened for regular business use. The sharing and extension of development can not only span across the banking services supply chain, but also extend to the non-banking supply chains within other industries. Thus creating new opportunities for banks and their clients.

OPEN ARCHITECTURES AND MANAGEMENT OF ASSOCIATED SECURITY RISKS

Open banking relies on access to various data to create new value for participants. However, the open nature and open access pose security challenges for all participants as malicious programs may be introduced. Banks, third party providers and FinTechs can leverage security protection for network, APIs, and client apps. But security threats will continue to be part of the industry. Secure Financial Services cloud with pervasive and homomorphic encryption techniques will safeguard the participants.

THE CULTURE SHIFT OF THE OPEN BANKING MOVEMENT

Traditionally banking has been a closed shop and was built on the trust between customers and advisors, and applications that protect all digital assets. As the regulation demanded openness and open access in a secure manner, the experience was enriched by the access to new features like account aggregation, partly automated account switching or automatic money transfers between accounts. Customers get value via banking apps that are based on open APIs.

Map of Regions

Regulation Driven:

Regions with Open Banking regulations

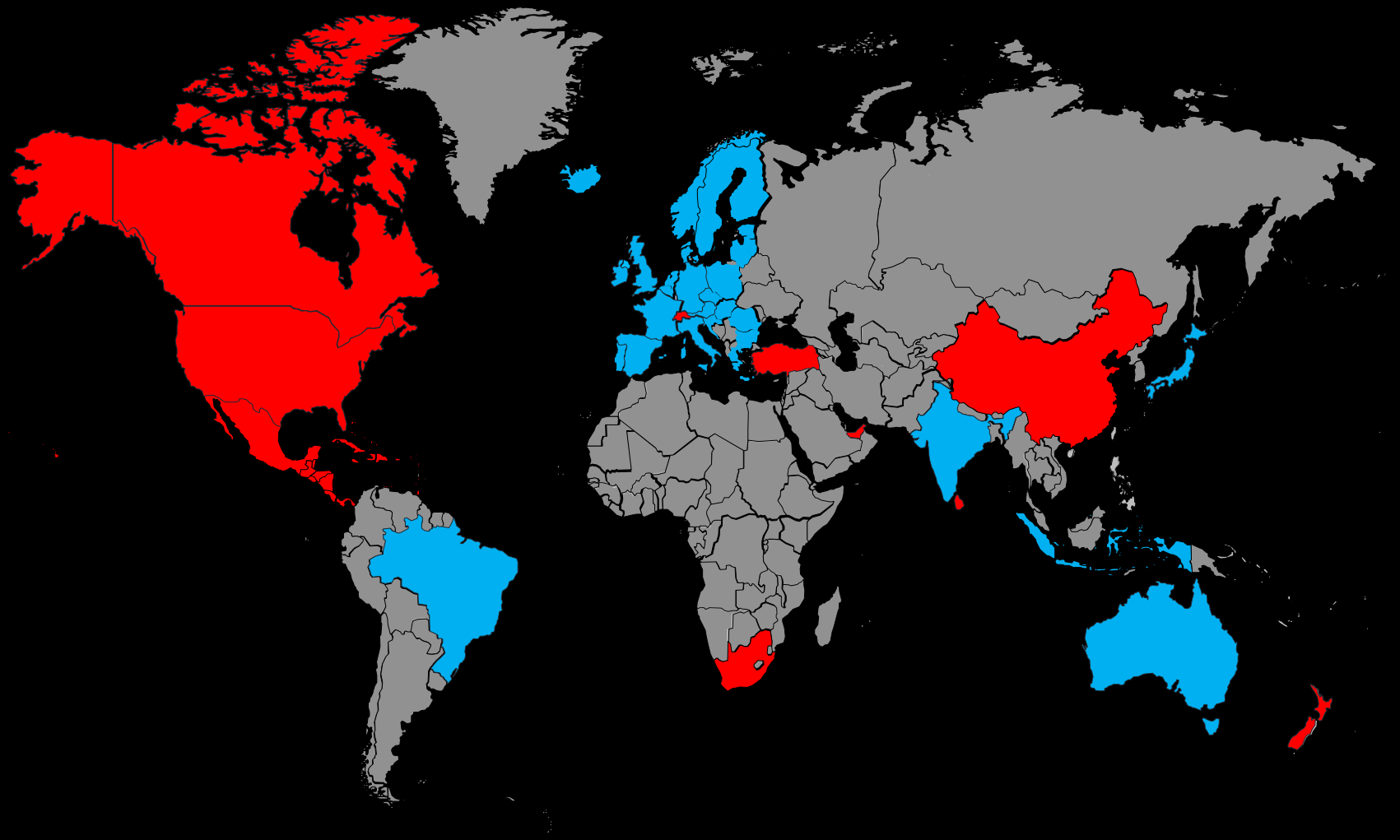
- Australia
- Brazil
- European Economic Area
- India
- Japan
- United Kingdom

Market Driven:

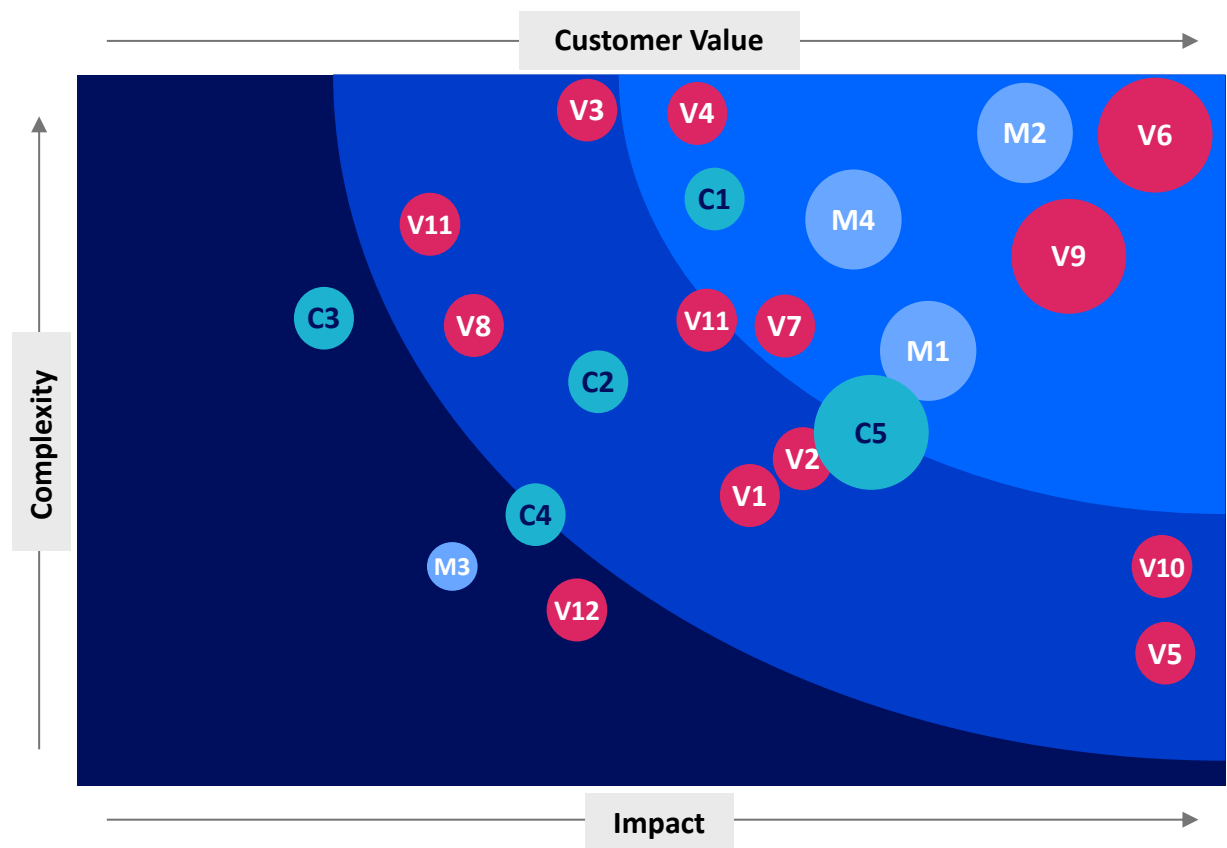
Regions driven by Banks, Fintechs, and Consumers

- Canada
- China
- New Zealand
- Singapore
- Sri Lanka
- Switzerland
- Turkey
- United Arab Emirates
- United States

Not all regions depicted are currently discussed in this document



Open banking opportunities and prioritization matrix



- Marketing
- Customer Loyalty
- Loan Financing
- Equity Actions
- Foreign Exchange Business

Categories of APIs

- eCommerce
- Payments and Settlement
- Investments
- Loan Origination
- Product Sale
- Account Opening
- Information Enquiry
- Loan Servicing

V

Value-driven use cases

- V1 Account aggregation
- V2 Budgeting
- V3 Financial product matching
- V4 Non-financial product matching
- V5 Financial coaching/nudges
- V6 Tax calculations
- V7 KYC
- V8 P2P lending/ matching
- V9 Third party referrals
- V10 Savings
- V11 Identity provider
- V12 Receipt management

C

Cross-industry use cases with embedded banking services

- C1 Mega App – YONO, WeChat, WhatsApp
- C2 Embed B2B, B2B2C payment processing
- C3 PoS lending
- C4 KYC, Financial Crime services
- C5 Current account as-a-service

M

Participate in or create a marketplace

- M1 Retail
- M2 eCommerce
- M3 Agriculture
- M4 Travel and Transport

Detailed Use Cases

Use Case	Industry/ Client	Open Banking Capability
Payment capture and processing – B2C or, B2B or, B2B2C (e.g. Retail stores, QR code based)	Cross-Industries	Read + Write
Transfer of funds as a new account is opened	Banking – savings	Read + Write
Payment of salaries, one-off bonuses in near real time	Cross-Industries	Read + Write
Account Aggregation	Banking	Read Only
Product matching based on income/ spend across banking/ non-banking products. For example – new mobile/ landline/ broadband/ gas/ utility/ TV & Entertainment/ Subscription packages	Cross-Industries	Read + Write
Identity verification services including ownership of account, account details, balance, transactions. Could be used for retail and SME customers	Cross-Industries	Read + Write
Confirming that the accounts are still active – pay 0.1 into a given account	Cross-Industries	Read + Write
Integration of banking data with cloud-based accounting and tax software	Cross-Industries	Read + Write
Tax-related payments	Cross-Industries	Read + Write
Receipt Management – attaching receipts to individual banking transactions	Cross-Industries	Read + Write

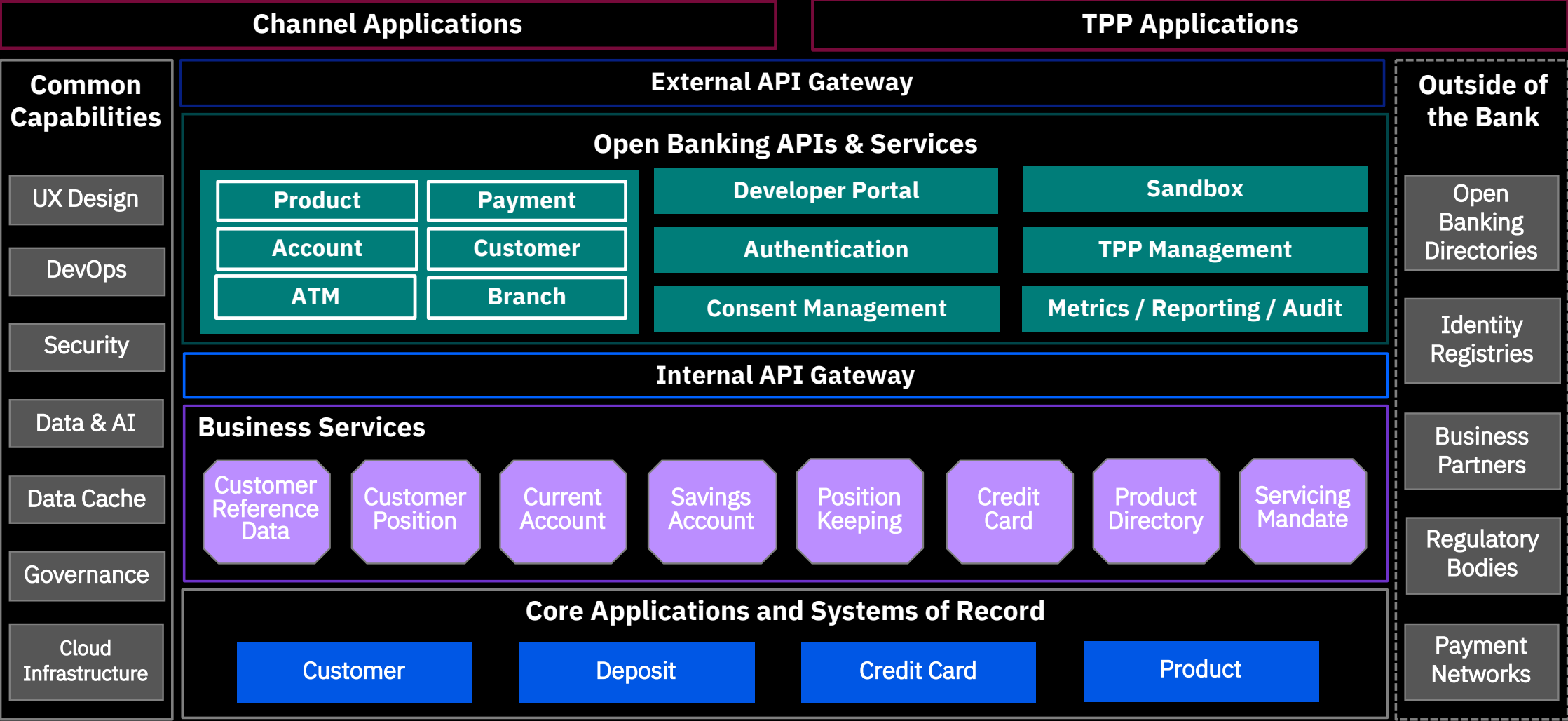
Detailed Use Cases

Use Case	Industry/ Client	Open Banking Capability
Transaction Categorization/ spend analysis	Banking	Read + Write
Prefill application forms – a new credit card, mortgage application that requires a lot of data and requires accuracy	Cross-Industries	Read only
Banking Connectors – using APIs to build connectors to banks across the world	Cross-Industries	Read + Write
Micro-lending at PoS terminals	Retail/ Banking	Read + Write
Provisioning of new accounts as a result of partner onboarding a customer (e.g. BBVA + Uber)	Cross-Industries	Read + Write
Bundling of products and services – bank owned or, partner products. Revenue management	Cross-Industries	Read + Write
Missing rewards/ cashback/ voucher and discount codes	Cross-industries	Read only
Travel (flight/ train) delay compensation	Cross-industries	Read only
Life event detection and budget/ savings planner including switching services/ avoiding product fee or, overdraft charges	Cross-industries	Read only
Account to Account charity transfers	Cross-industries	Read + Write

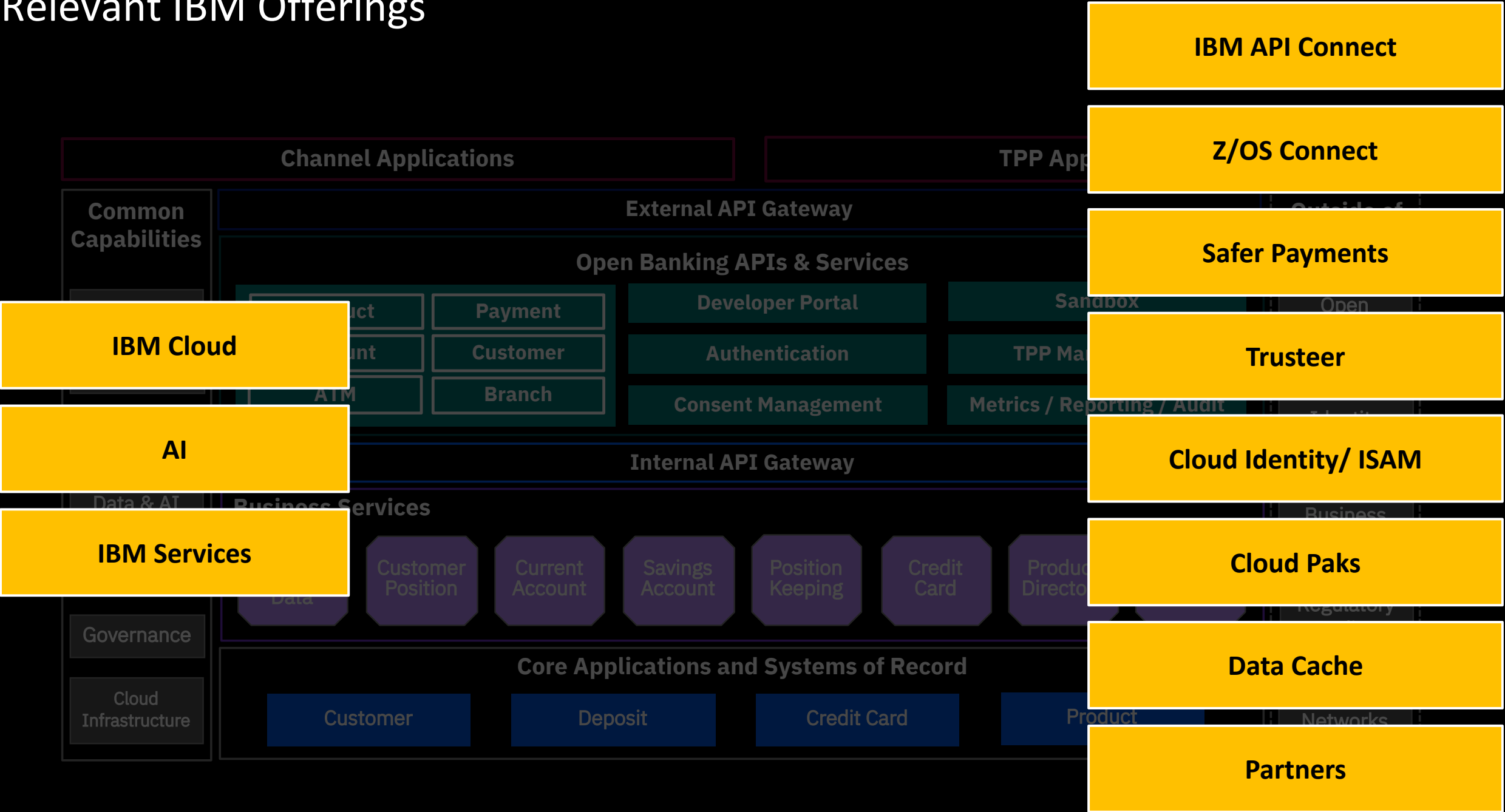
How they Compare

Use Cases/ Drivers	Account & Statement Information Services	Payment Services	Personal Financial Management, Financial well-being, & Wealth Management	Commercial Banking/Wholesale Banking	Transaction Authentication	“Super” Apps	Lending/Loans	Creation of a new account	Foreign Currency Exchange	Integration with third party services	Read-Only Data Points
China											
India											
Japan											
Singapore											
Sri Lanka											
Australia											
New Zealand											
U.S.A											
Canada											
Brazil											
EU											
Turkey											
U.A.E											

Open Banking Reference Architecture



Relevant IBM Offerings



Asia

China	13
India	19
Japan	32
Singapore	44
Sri Lanka	47

China

WHAT IS OPEN BANKING IN THE COUNTRY?

- Open banking is widely adopted by banks and Fintechs in China, led by Fintechs and large banks, to grow their customer base and to meet the growing needs of their customer
- Tier 1 and 2 banks build their own ecosystems and collaborate with Fintechs
- Fintechs (Alibaba, Tencent, Baidu, JD, Meituan, etc.) dominate the consumer finance ecosystems and collaborate with banks
- Tier 3 and 4 banks infuse their financial services capabilities into Fintechs using API/SDK



Research Report of Open Banking 2019 by the National Internet Finance Association of China (NIFA), a national self-regulatory organization in the field of internet finance and is initiated by the People's Bank of China in collaboration with relevant ministries and commissions



China

REGULATORS & REGULATIONS ISSUED

People's Bank of China is the main banking regulator

In the FinTech Development Plan (2019-2021), PBoC outlined several open banking related action items

- Extend the financial services channels including using API and SDK for cross industry collaboration
- Improve the operational efficiency of financial services services using technology including Mobile Internet, AI, Big Data, and Image Recognition
- Enhance capabilities for more inclusive banking
- Optimize the SME loan and financing services

(九) 拓宽金融服务渠道。

充分运用信息技术与互联网资源做线上服务，丰富完善金融产品和业务模式，为客户的线上金融服务。进一步发挥线下资源优势，构建线上线下一体化的经营发展模式，加布局规划和全渠道服务实施方案，实现电子渠道与实体网点、自助设备等信息共享和营销，跨渠道服务水平，解决线上线下发展不平衡不充分的问题。借助应用程序编程接口（API）等工具包（SDK）等手段深化跨界合作，在依法合规前提下将金融业务整合解构和模块不同应用场景中自行组合与应用，借助各行业优质渠道资源打造新型商业范式，实现资源开放、合作、共赢的金融服务生态体系。

(十一) 提升金融服务效率。

积极利用移动互联网、人工智能、大数据、影像识别等技术推动传统实体网点向营销型、体验型转变。优化改进网点布局和服务流程，缩减业务办理时间，提升网点营业效率。探索基于跨行业数据资源共享身份验证，提升金融服务客户识别效率。探索轻型化金融服务模式，打造对内聚合产品与服务连接合作机构与客户的综合性金融与民生服务平台，发挥客户集聚效应，降低金融服务边际成本。提升服务与社会服务效率。利用云计算等技术实现资源高度复用、灵活调度和有效供给，探索构建跨区域的自动化、智能化业务处理中心，提升金融服务运营效率。

(十二) 增强金融惠民服务能力。

强化金融服务意识，下沉经营重心，加大对零售客户的服务力度，使金融科技发展成果更多地惠及民生。依托基础设施，发挥移动互联网优势，面向“三农”和偏远地区尤其是深度贫困地区提供安全、便捷高效的特色金融科技服务，延伸金融半径，突破金融服务“最后一公里”制约，推动数字普惠金融发展和探索金融惠民创新服务模式。借助移动金融、情景感知等手段将金融服务深度融入民生领域。进一步展金融惠民在衣食住行、医疗健康、电子商务等方面的应用拓展，实现主要民生领域的金融惠民服务广覆盖。提升社会保障、诊疗、公用事业缴费等公共服务便利化水平。

(十三) 优化企业信贷融资服务。

加大金融科技产品服务创新力度，加强人工智能、移动互联网、大数据、小微企业、民营企业、科创企业等重点领域的信贷流程和信用评价模型，评估企业信用状况，降低运营管理成本，提高贷款发放效率和服务便利度，促进经济转型升级和新旧动能转换。基于海量数据处理和智能审计等技术，提升能力等，降低信息不对称，加强风险预测和预警，及时调整融资主体差、清偿难度大的高风险企业，为解决脱实向虚、资金空转等问题提供决策支持，确保信贷资金基于真实交易，通过跨界融合、搭建供应链金融服务平台上下游企业提供高效便捷的融资渠道，解决供应链资金配置失衡等问题，发展的关键领域和薄弱环节。

中国人民银行文件

银发〔2019〕209号

中国人民银行关于印发《金融科技（FinTech）发展规划（2019—2021年）》的通知

中国人民银行上海总部，各分行、营业管理部，各省会（首府）城市中心支行，各副省级城市中心支行；国家开发银行，各政策性银行、国有商业银行、股份制商业银行，中国邮政储蓄银行；各证券公司、基金公司、期货公司、私募投资基金管理机构；各保险集团（控股）公司、保险公司、保险资产管理公司；中国银联股份有限公司、中国支付清算协会、中国互联网金融协会、网联清算有限公司；各非银行支付机构：

为促进金融科技健康可持续发展，人民银行组织编制了《金

— 1 —

[FinTech Development Plan \(2019-2021\) by People's Bank of China](#)

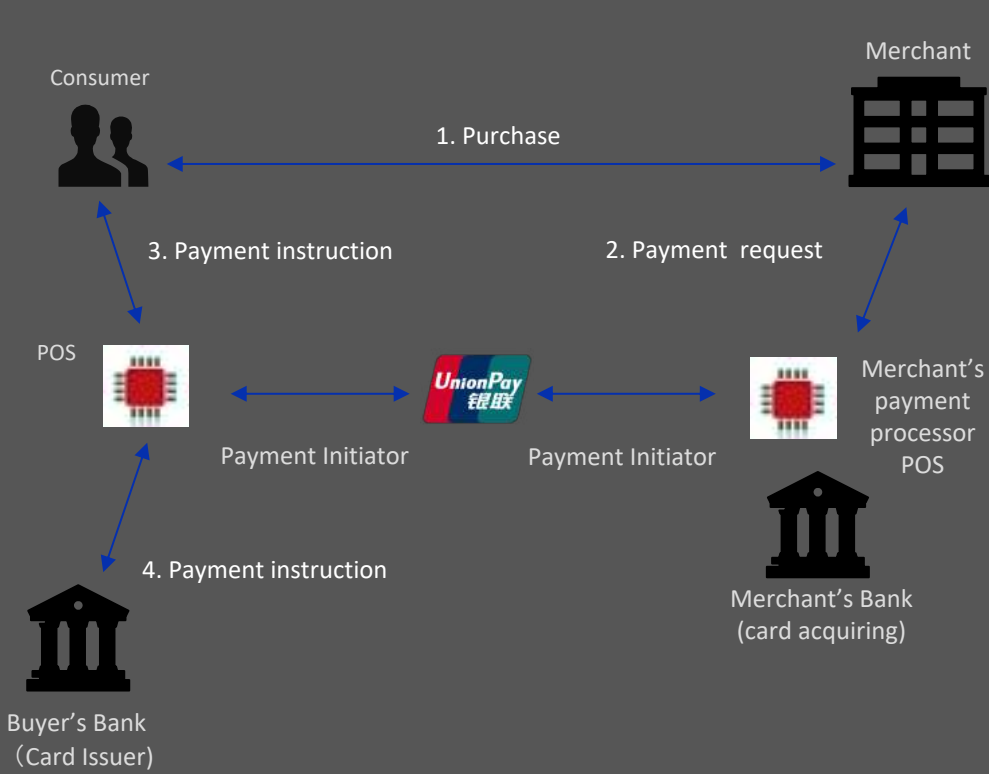
China

USE CASES

Retail Payments

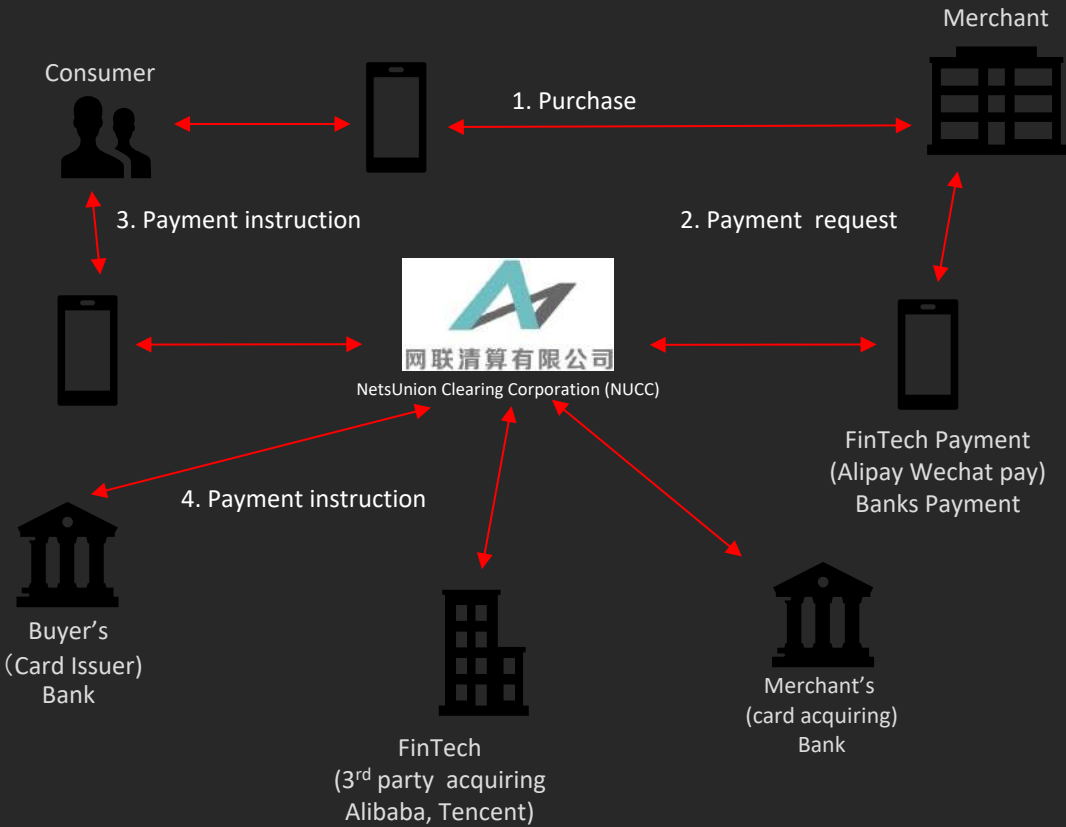
Before:

POS, offline, banks dominate China payment market



After:

Mobile apps, 3rd party FinTechs (Alipay, WeChat Pay) dominate payment market, banks are catching up

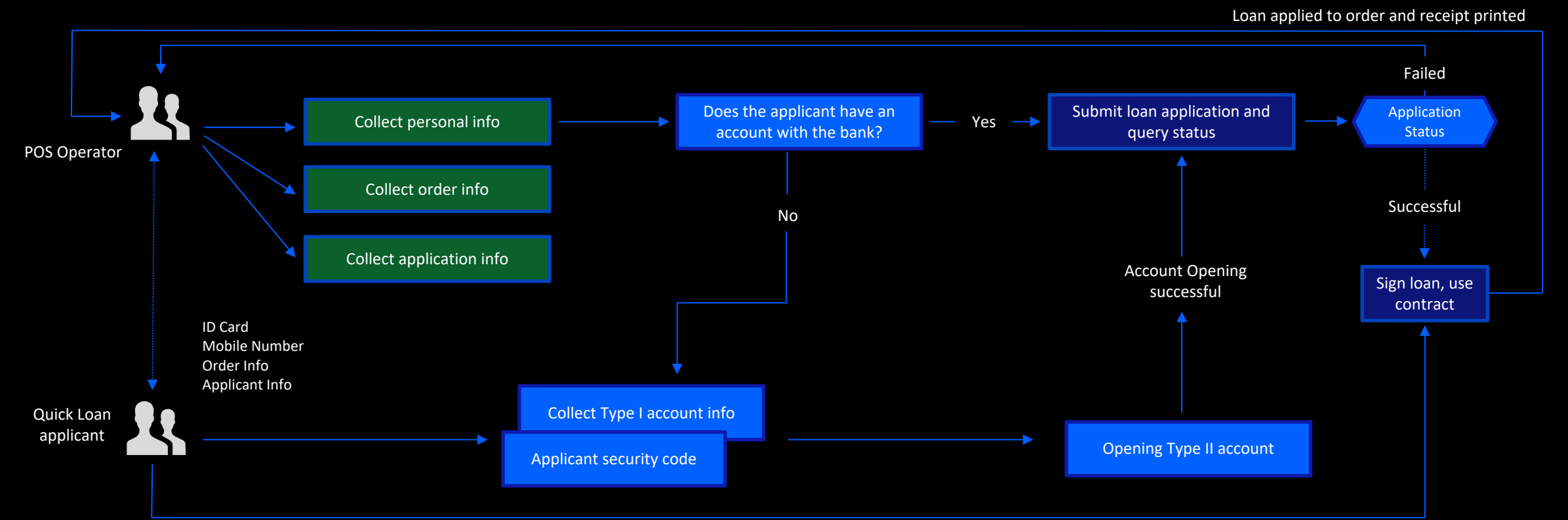


China

USE CASES

Consumer Loans at POS

At the Point of Sale (POS), the customer applies for a Quick Loan to pay for the purchase. The POS operator uses the smart POS to collect required information to open a type II account for the customer, submits a quick loan application, and completes the purchase transaction once the loan is approved.



China

CONSUMER ADOPTIONS

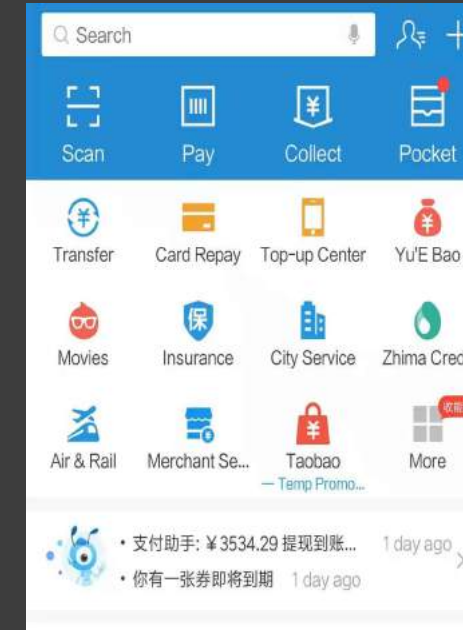
Fintechs and banks to consumers - retail banking payment

- Alipay with 400M customers
- WeChat pay with 600M customers
- CMB mobile apps with 100M customers

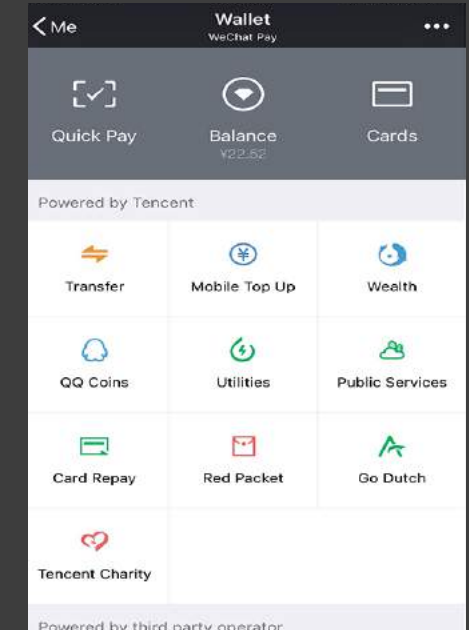
SPD Bank (Shanghai Pudong Development Bank)

- 400+ API endpoints, covering consumer & business accounts, consumer & business loan, payments & settlement, investment & wealth, foreign currency exchange, rewards, bank information, and more
- 200+ business partners using these APIs
- 3,300,000 API calls per day

Alipay



WeChat



CMB Payment



China

TECHNICAL STANDARDS

Open banking initiatives in China are driven by market competition, not by government regulation.

There are no current standards. The [China Banking Association](#) is working on technical standards with focus on

- Data standards
- API/SDK standards
- Data security
- Data privacy
- 3rd party management
- Data exchange management
- And more



India

WHAT IS OPEN BANKING IN THE COUNTRY?

While India did not adopt Open Banking or PSD2 as is, in the year 2016, Reserve Bank of India (RBI), the Indian banking regulator adopted concepts underlying Open banking / PSD2 via a directive for the registration and operations of Account Aggregators (AA). The AAs, similar to TPPs, will facilitate exchange of customer's financial data among banks, FinTechs, other users based on customer's consent.

As per RBI, "Business of an account aggregator" means the business of providing under a contract, the service of, retrieving or collecting information of its customer pertaining to such financial assets, as may be specified by the Bank from time to time; and consolidating, organizing and presenting such information to the customer or any other person as per the instructions of the customer.

However, much before PSD2, in 2009-10, the Government of India had already started building unique identification (UID-Aadhaar) for India and had made the API available.

This in turn spurred API activity as banks and FinTechs wanted to leverage UID for business purposes. Between 2010 and 2016, Government of India built various APIs for nationwide use, known as the India Stack. This included Unified Payments Interface (UPI) that unleashed changes in Indian payments, banking and FinTech industries.

Taking cues from the changes in the global banking industry in terms of regulatory underpinnings of PSD2, open banking, many forward looking Indian banks such as top private banks and some public sector banks including State Bank of India (SBI), the largest Indian bank, adopted APIs to trigger innovation, build customer centric applications and develop competitive advantage.

Largely, the Indian banking sector has two flavors of Open banking, Account Aggregators initiated by RBI and voluntary adoption by the banking industry and FinTechs.

India

WHAT IS OPEN BANKING IN THE COUNTRY?

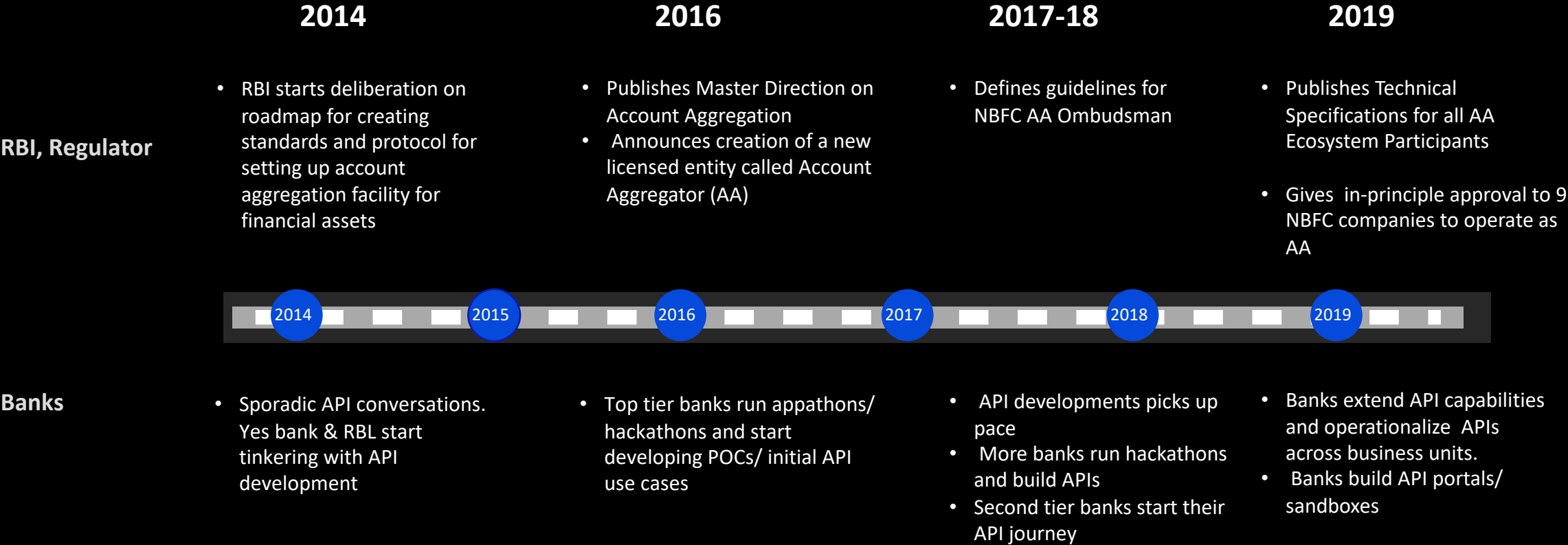
There are similarities between Open Banking in UK / PSD2 in Europe and Account Aggregation in India

Entity	Description	Indian Context	Account Aggregation
Account Servicing Payment Service Providers (ASPSP)	An organization providing and maintaining Payment Accounts for customers.	Banks	Financial Information Provider (FIP)
Account Information Service Provider (AISP)	AISP is a TPP, that makes use of PSD2 APIs only for the purpose of requesting information regarding the Account Balance, Transaction and Profile. It can potentially aggregate customer's account information across multiple accounts and across multiple ASPSP to provide a consolidated view of finances to applications such as a.	NBFC – AA	NBFC – Account Aggregator
Payment Initiation Service Provider (PISP)	PISP is a TPP, that makes use of PSD2 APIs for the purpose of making payments.	UPI	Unified Payment Integrator

India

WHAT IS OPEN BANKING IN THE COUNTRY?

RBI supported APIs but Indian banks started earlier..



India

USE CASES & CONSUMER ADOPTIONS

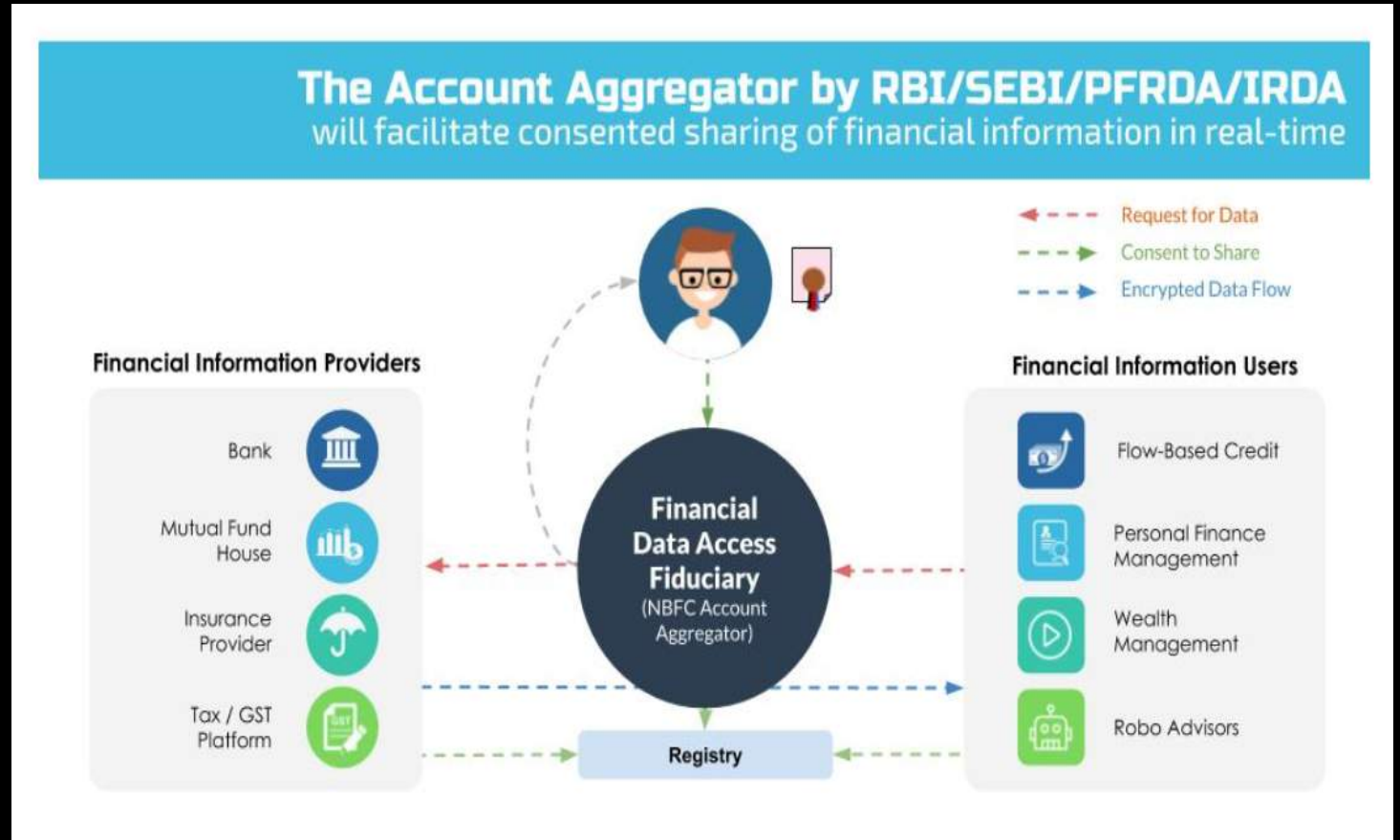
Licensed Account Aggregators

- Aditya Birla Trustee Co Pvt Ltd.
- CAMS FinServ
- Cookiejar Technologies Pvt Ltd. (Product titled Finvu)
- Jio Information Solutions Limited
- NESL Asset Data Limited
- Perfios Account Aggregation Services Pvt Ltd.
- Yodlee Finsoft Pvt Limited

India Stack Indicators

- 1.254 Billion Aadhaar enrollments
- 38.426 Billion Aadhaar authentications
- 339 million Aadhaar linked bank accounts
- 7.944 billion eKYC
- UPI handles over 1 billion transactions / month with value of USD 27 billion in value

[Source](#)



India

USE CASES

Indian banking has many new entrants such as payments banks, neo banks, digital only banks by incumbents and FinTechs. For all these new entrants, API adoption is a fundamental strategy. With lack of legacy systems, API adoption is an easier and prudent choice. Various FinTech business models such as below use APIs extensively

- Payment Gateways
- Digital Wallets
- Digital Insurance/ InsurTech
- Digital lending
- PoS
- Payments banks
- Tech companies in financial services
- Transaction delivery
- Neo banks
- Alternative credit scoring
- API-based bank-as-a-service platforms
- Alternative insurance underwriting

Indian Neo Banks include Open Bank, NiYo, Yelo, eipFi Digital Banks

- Digibank by DBS is a mobile-only bank offering products like savings/deposits, investments, insurance, loans, cards, remittances.
- 811 by Kotak Mahindra Bank is full-service digital bank account with a mobile app, a virtual debit card, up to 6% interest, zero charges on non-maintenance of balance, and free online money transfers.

India

USE CASES

FinTechs

- Payment Gateways: Cashfree, ATOM technologies, CCAvenue, BillDesk, Instamojo, OboPay, Ingenico, DirecPay
- Digital wallets: Google Pay, Amazon Pay, Mobikwik, PayZapp, Paytm, PhonePe, Ezetap, Freecharge, Jiomoney
- SME Lending: Lendingkart, ezetap, LoanTap, Capital Float
- Alternative Credit scoring: ePayLater, NeoGrowth, Lendingkart, Aye Finance, RupeeCircle, Indifi Technologies
- Yodlee: financial data aggregation platform provides APIs that deliver data from over 21,000 global data sources and provide the bank with credit card, investment, loans, rewards, and financial account data you need

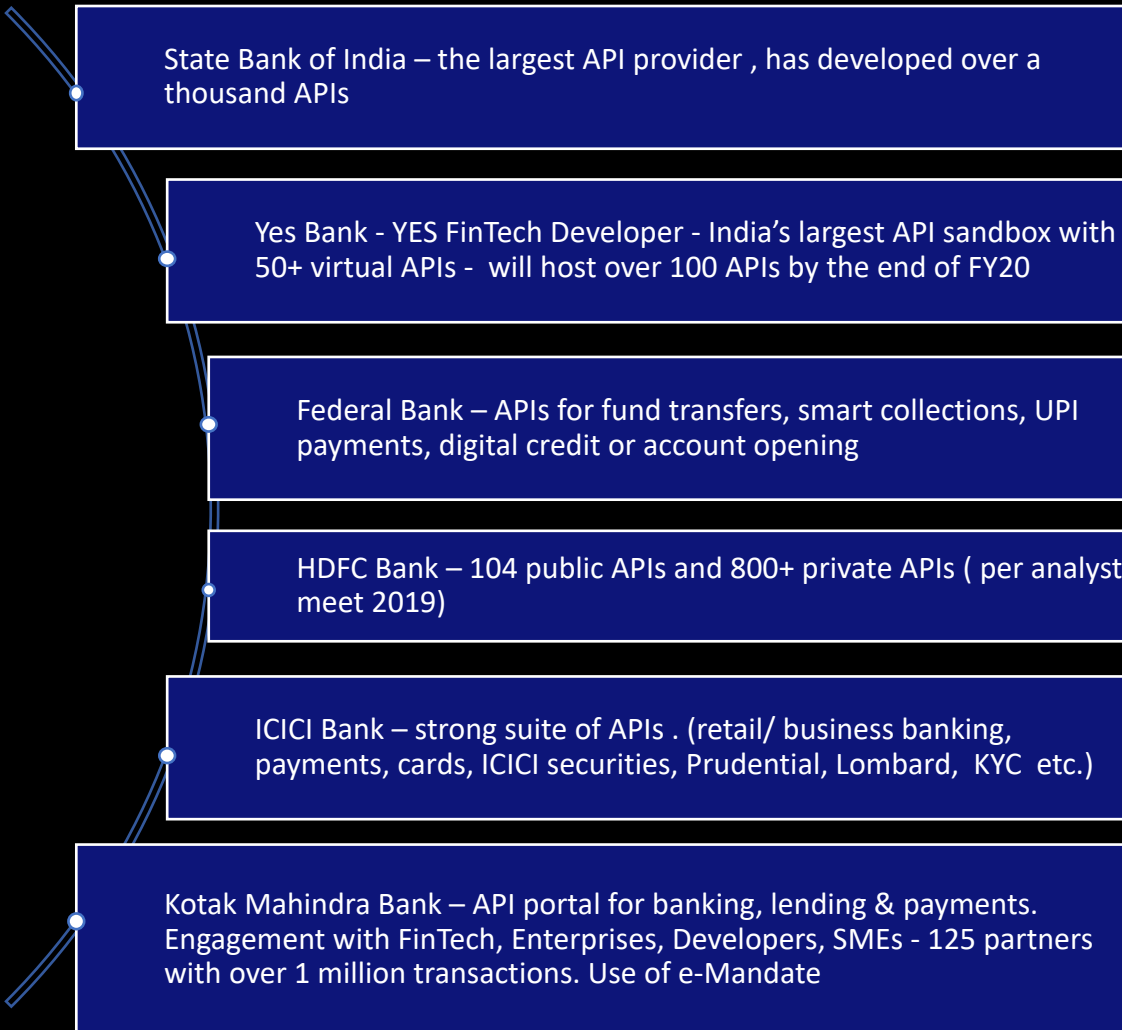
FinTech Collaboration - Many financial institutions have developed API sandboxes that can be used by FinTechs

- National Stock Exchange's (NSE) open trading API sandbox will allow FinTech start-ups to build trading, portfolio management and analytics applications.
- HDFC bank is collaborating with FinTechs. These FinTechs, such as, Betterpalce, Hylo, GetOn Infotech, Pennant Fin Services, DocBoyz, use HDFC bank's APIs e.g. for innovative solutions for bank and its own customers.

India

CONSUMER ADOPTIONS

Banks are creating API ecosystem /API economy in India



- Banks are developing public, private APIs for various business units like retail banking, corporate banking and for KYC, cards, lending, trade finance, cash management payments, business etc.
- Banks are collaborating with FinTechs to drive innovation and are using APIs to share the data both ways
- Banks are also consuming APIs such as for UPI, Aadhaar.

India

CONSUMER ADOPTIONS

India' API based Innovation story has appealed to many countries

India is taking its digital success stories such as Aadhaar, Direct Benefit Transfer (DBT) and the Unified Payments Interface (UPI) to other countries, as a means of strengthening its ties through 'digital diplomacy'.

India has already built an e-office platform for Sri Lanka last year

Cambodia has started work with India team for soil health card project

Morocco is interested in building an Aadhaar like digital identity program.

UPI is being explored in Singapore and in United Arab Emirates. Few FinTechs have already started getting queries from international banks, financial institutions and governments from Singapore, UAE, China, Africa, Egypt, Nigeria, Sri Lanka, Philippines, Bangladesh and South East Asian countries.

BHIM UPI for Singapore, jointly developed by National Payments Corporation of India (NPCI) and Network for Electronic Transfers (NETS) of Singapore, is expected to launch in February 2020.

NPCI has setup a subsidiary to export the much-acclaimed UPI for governments and central banks interested in implementing similar instant fund transfer in their countries.

Top technology firms such as Google, Facebook and Uber among others which are using the unique challenges of the country to create innovative products for the country first and then are rolling them out globally after they become successful in India (e.g., Tez- Google Pay)

India

CONSUMER ADOPTIONS

API Platform players in the Indian market

With growing interest in API usage across private and public banks, API platform companies have emerged such as:



Yap, banking and payment products-focused API platform – clients include banks like Yes Bank, DCB Bank, Equitas Small finance bank, and FinTechs like Cred, Open bank, Niyo.



Setu, claims to build low-cost, modular API infrastructure, marketplace for FinTech APIs that developers can cherry-pick to cater to the specific needs of their niche customers. Enabling FinTech to power India's financial infrastructure needs tomorrow and go live in a matter of days, not months. (<https://docs.setu.co>)



Zeta, a FinTech has launched Fusion, an API based platform as a service for other FinTechs in Nov 2019. Its API banking platform has been adopted by 70 FinTechs in the last two months. The FinTechs can collaborate with banks that are customers of Zeta such as RBL bank, IDFC First bank, and Kotak Mahindra bank



Yappes, a Unified Platform for API management and distribution. It allows Developers to build their APIs from scratch. Users can design, develop, test, and release a production ready API for distribution all on the Yappes platform. API Providers can build, design and manage APIs from scratch or onboard the existing APIs.

India

TECHNICAL STANDARDS & ARCHITECTURE

Regulations, Guidelines and Technical Standards for Open (API) Banking in India

Open Banking draws its momentum from regulation and governmental drive. Reserve Bank of India, the banking regulator has issued regulations for Account Aggregators which draws on underlying concept of Open Banking.

- [Guidelines for NBFCs on becoming Account Aggregators issued in 2016](#)
- [Technical Specifications for all participants of the Account Aggregator \(AA\) ecosystem, issued in 2019](#)

Institute for Development & Research in Banking Technology (IDRBT) established by RBI for spearheading technology absorption in the Indian Banking and Financial Services Sector has issued a handbook on APIs.

- [https://www.idrbt.ac.in/assets/publications/Best%20Practices/2019/handbook on API\(2019\).pdf](https://www.idrbt.ac.in/assets/publications/Best%20Practices/2019/handbook_on_API(2019).pdf)

India

TECHNICAL STANDARDS & ARCHITECTURE

Reporting requirements for Account Aggregators

As per "**Reporting of transactions to FIU or other competent authorities**" clause # 5.11, NBFCs (Account Aggregators) would be responsible for making Currency Transactions Reports and Suspicious Transactions Reports to FIU or any other competent authority in respect of the NBFCs' customer related activities carried out by the service providers.

As per "**Data Security**" clause # 8 (f), Information System Audit of the internal systems and processes shall be in place and shall be conducted at least once in two years by CISA certified external auditors. Report of the external auditor shall be submitted to the Regional Office of the Department of Non-Banking Supervision of the Bank, under whose jurisdiction the Registered Office of the Account Aggregator is located, within one month of submission of the report by the external auditor.

As per "**Corporate Governance**" clause #14, An Account Aggregator shall have adequate internal mechanisms for reviewing, monitoring and evaluating its controls, systems, procedures and safeguards. The integrity of the IT systems shall be maintained at all times and all necessary precautions taken to ensure that the records are not lost, destroyed or tampered with.

Information System Audit of the internal systems and processes shall be in place and shall be conducted at least once in two years by external auditors. Report of the external auditor shall be submitted to the Regional Office of the Department of Non-Banking Supervision of the Bank, under whose jurisdiction the Registered Office of the Account Aggregator is located, within one month of submission of the report by the external auditor

India

TECHNICAL STANDARDS & ARCHITECTURE

Reporting requirements for Account Aggregators

As per “**Audit Function**” clause #14.2.1, An Account Aggregator shall constitute an Audit Committee, consisting of not less than three members of its Board of Directors

As per “**Fit and Proper Criteria**” clause #14.5.1, Account Aggregator shall furnish to the Bank an annual statement on change of directors/managing director/ CEO duly certified by the Statutory Auditors that fit and proper criteria in selection of the directors has been followed. The statement must reach the Regional Office of the Bank within 15 days of the close of the year.

As per “**Returns**” clause #17, The Bank may, from time to time, prescribe returns to be submitted by Account Aggregator as deemed fit.

The NBFC-AA shall provide to the director periodic reports on the functioning of internal control system including effectiveness thereof

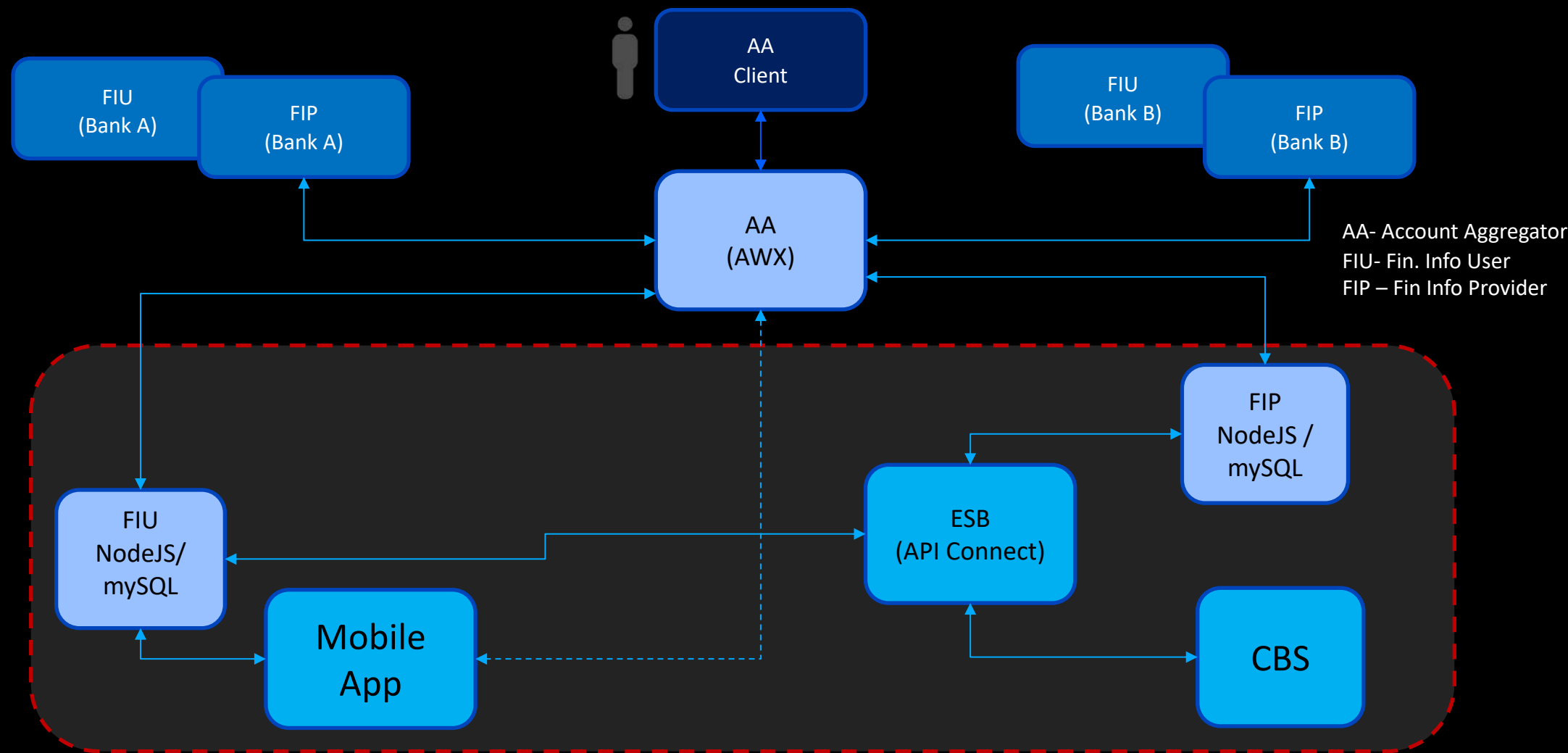
As per “**Supervision**” clause #18, The Bank may, at any time, cause an inspection by one or more of its officers or employees or other persons, of any Account Aggregator and at any intervals as it deems fit.

The NBFC shall appoint a compliance officer who shall be a senior executive reporting to the Board and be responsible for setting forth policies and procedures and shall monitor adherence to the applicable laws and regulations and policies and procedures including but not limited to directions of Reserve Bank of India and other concerned statutory and governmental authorities.

India

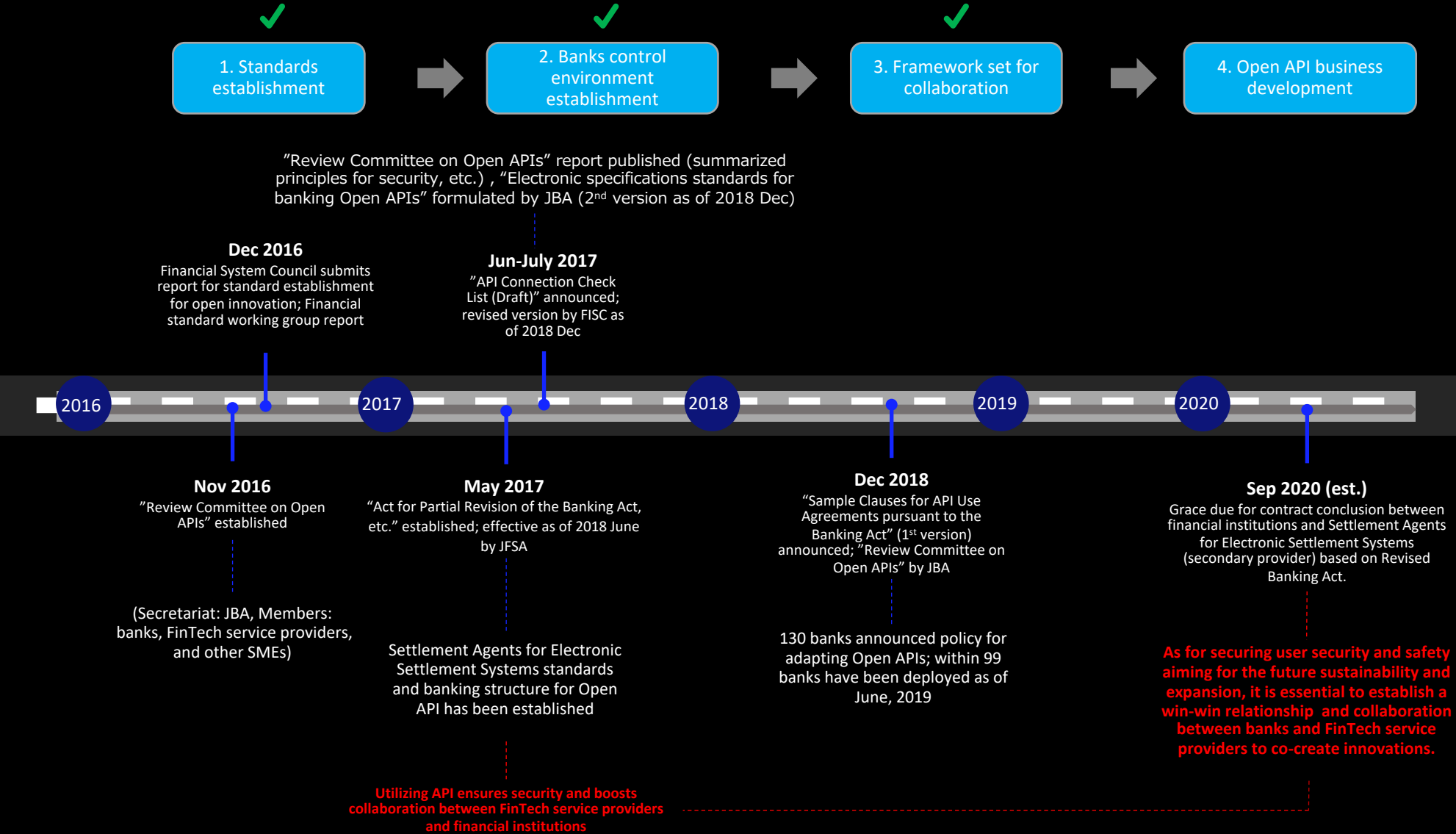
TECHNICAL STANDARDS & ARCHITECTURE

Reference Architecture for Account Aggregators



Japan

WHAT IS OPEN BANKING IN THE COUNTRY?



Japan

REGULATORS & ANY REGULATIONS ISSUED



Financial Services Agency (FSA) is responsible for (i) ensuring the stability of the financial system; (ii) protecting the users of financial instruments and services, such as depositors, insurance policy holders, and investors; (iii) facilitating the smooth function of financial services

[Banking Act](#)



The Japanese Bankers Association (JBA) is a premier financial organization whose members consist of banks, bank holding companies and bankers' associations in Japan. The organization is responsible for planning concerning the operation of Payment Systems, promoting Proper Consumer Transactions, promoting CSR and Reinforcing Compliance, supporting Banking Business of Member Banks.

[Report of Review Committee on Open APIs: Promoting Open Innovation](#)
[Sample Clauses for API Use Agreements pursuant to the Banking Act](#)



FISC (The Center for Financial Industry Information Systems) was established in November 1984 as an incorporated foundation under the approval of the then Minister of Finance. In April 2011, FISC was approved by the Prime Minister to change its classification to become a public interest incorporated foundation.

The contributors are of wide range including financial institutions, insurance companies, securities firms, computer manufacturers and telecommunications companies. In collaboration with its member institutions, the Financial Services Agency and the Bank of Japan, FISC has established the following guidelines for the promotion of security measures on financial institutions information systems. These guidelines have been voluntarily observed by most financial institutions in Japan.

[API Connection Checklist for Financial Institutions and API Connection Partners Manual](#)

Japan

REGULATORS & ANY REGULATIONS ISSUED

Definition of Electronic payment services by Banking Act

Two classifications (“Type 1” and “Type 2”), are roughly equivalent to PSD2’s PISP and AISP respectively, starting Apr 1, 2018, any FinTech in good financial standing can register.

- Type 1: Receiving the trust of the depositors, and transmitting a direction of the fund transferring to the bank online
- Type 2: Receiving the trust of the depositors, and acquiring account information online, and providing it (including the processing information)

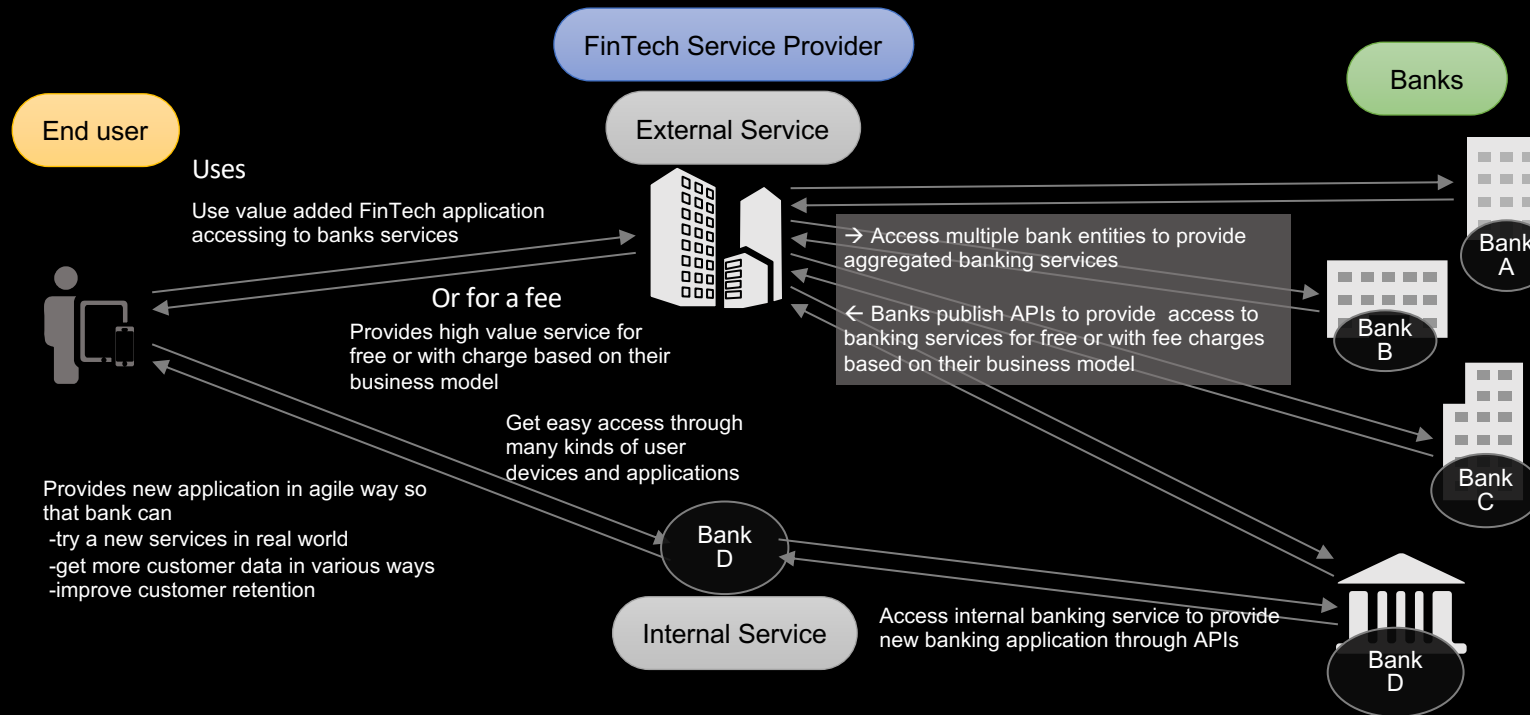
Banks are required to cooperate with registered agencies to provide system/API access , cannot deny access without proper reason (stop short of PSD2-style mandate).

Information security and consumer protection standards to be defined by an industry certification body (yet to be determined).

Japan

REGULATORS & ANY REGULATIONS ISSUED

There are many business models and business use cases in the API banking space. The typical context below consists of end users, FinTech Service Providers as API consumers, and banks as API providers.



Japan

USE CASES

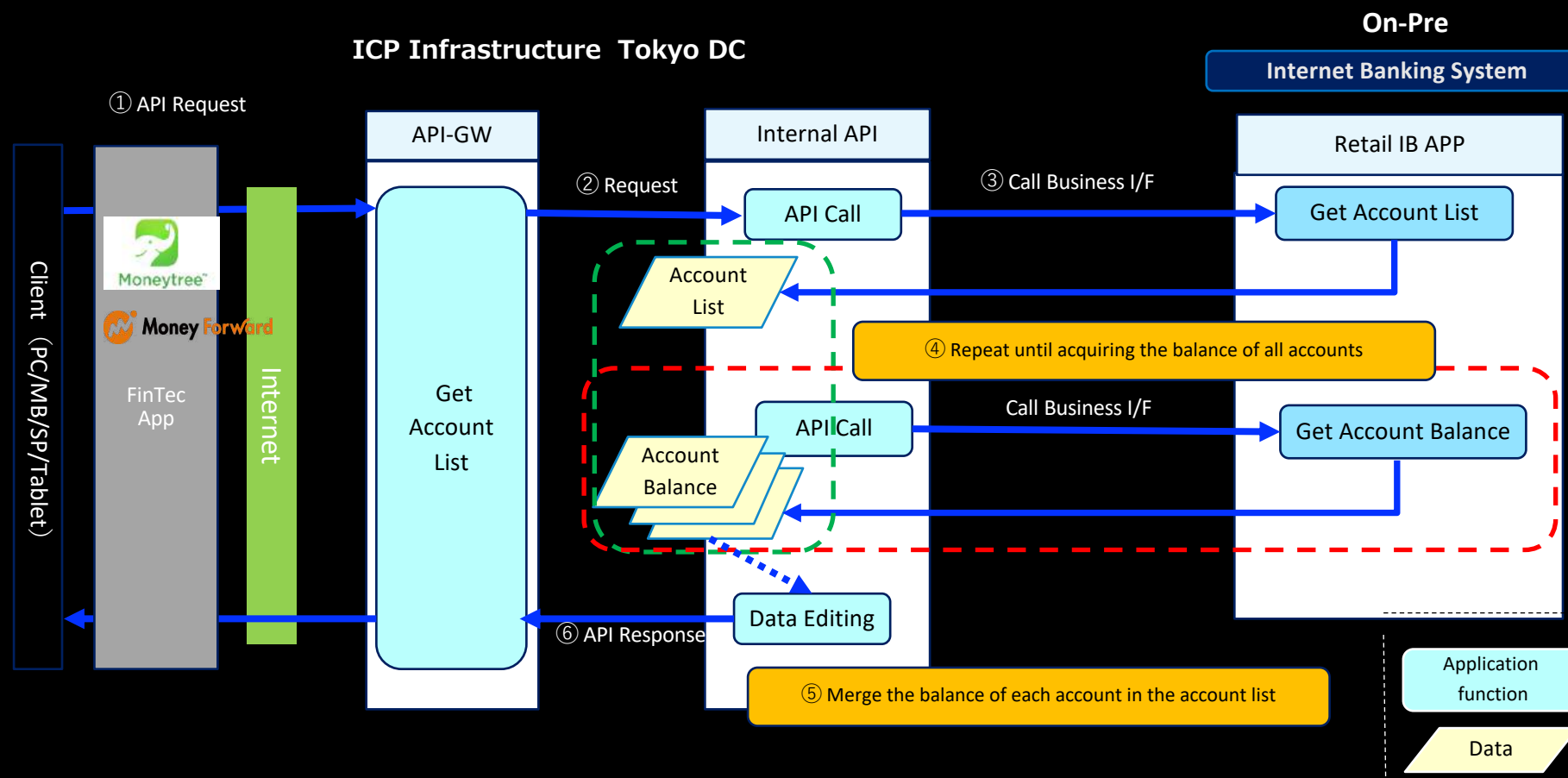
Category	Use cases	Banks advantage
Personal financial management service	• Personal financial management service; aggregates all financial assets automatically including bank account, credit card, securities account, points, etc.	When linking in-house applications • Enhancing application function by utilizing more information sources • Increasing customer satisfaction by providing services that improve convenience • Activating account usage
Cloud accounting service	• Cloud accounting service for sole proprietor or SME; integrate online banking information such as account balance or withdrawal details. • Settlement of expenses	
Algorithmic saving service	• Automatic saving service deciding saving amount based on fixed algorithm; card settlement timing or daily number of steps taken	• Providing new financial services to customers
QR code settlement service	• QR code settlement service for smartphone • Payment amount will be directly withdrawn from bank accounts	• Expanding settlement methods

Japan

USE CASES

- Customers usually own multiple accounts at multiple financial institutions, therefore FinTech companies first established themselves to provide Account Aggregation services
- At first, Account Aggregation FinTech companies gathered information by screen scraping but recently changed to acquiring information by APIs

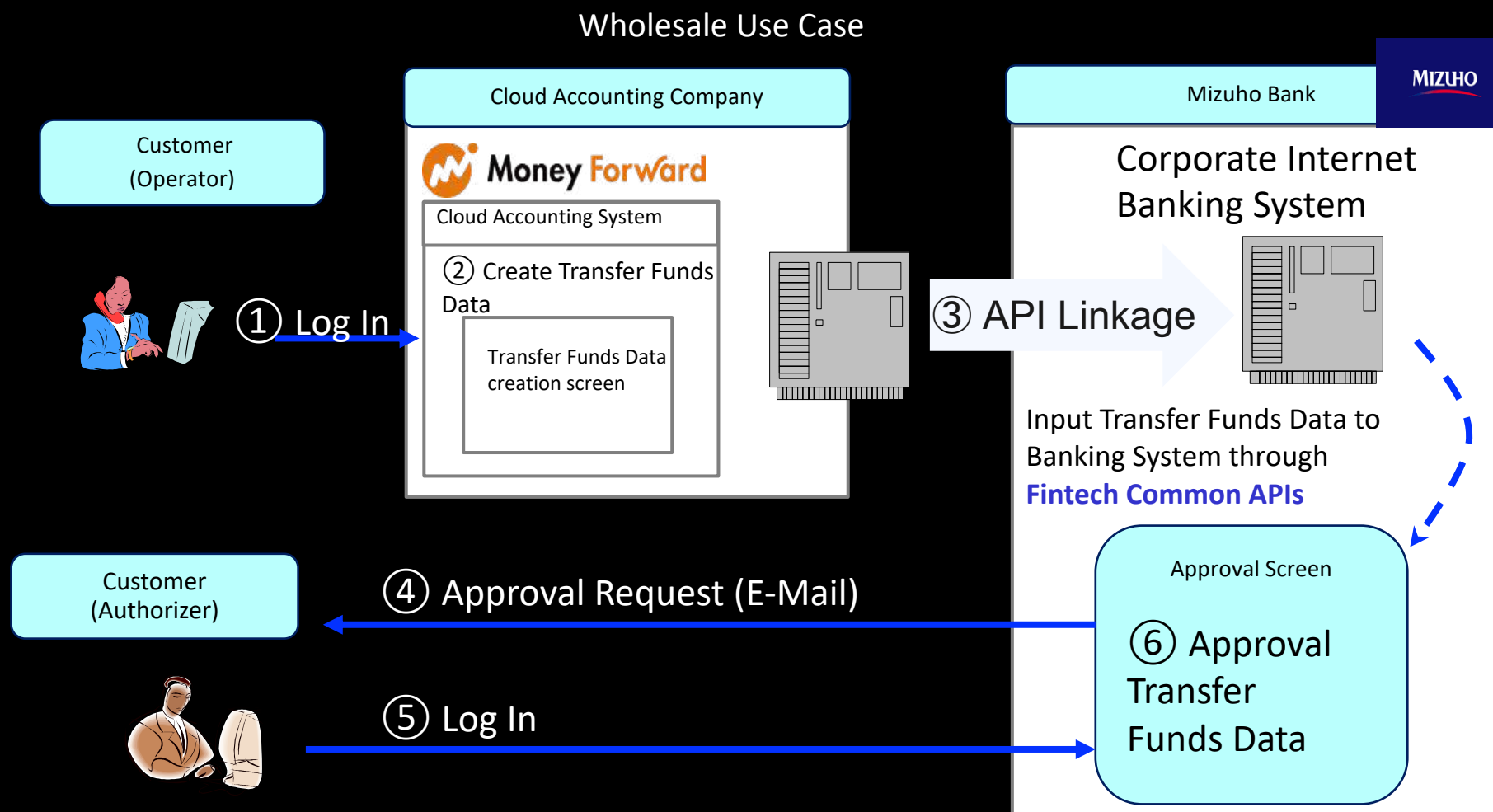
Connect to PFM (Account Aggregation) Application with OpenAPI



Japan

USE CASES

With Mizuho Business WEB's Bulk fund transfer API, external companies can directly provide customers the Bulk Fund Transfer option on Mizuho Business WEB and convenience is improved. It is necessary to approve the request in the bank system.



Japan

USE CASES

MoneyForward (9M users)

あなたの利用
エッセ

おすすめの銀行

- 三菱東京UFJ銀行
- みずほ銀行
- 三井住友銀行
- 住信SBIネット銀行

Recommended
bank list;
-MUFG
-Mizuho
-SMBC
-SSNB

銀行

セキュリティについて

ログイン情報

契約者番号 (5桁-5桁)
ハイフンの有無は問いません

第一暗証

Login info;
-contract #
-1st PIN #

資産総額

一覧 内訳 推移

一覧表示

三菱東京UFJ銀行 ¥5,405

ANAマイレージ ¥19,180

JALマイレージ ¥91

Asset Value;
-Bank account
-ANA Mileage
-JAL Mileage

Moneytree (5M users)

22:49

TRUSTe
CERTIFIED PRIVACY

ログインするためにはメールアドレスとパスワードが必要です

メールアドレス
email@example.com

パスワード
●●●●●●

Authentication
required;
-e-mail address
-password

店番号を入力してください。

入力してください

口座番号を入力してください

入力してください

第一暗証を入力してください。

入力してください

Please fill in...
-branch #
-account #
-1st PIN #

口座残高

全資産 ¥5,355

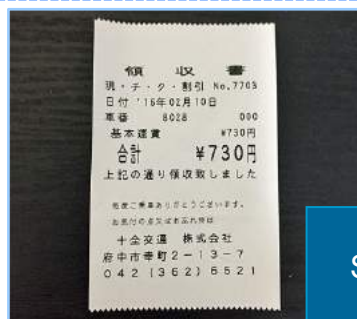
銀行口座 ¥5,355

クレジットカード ¥0

電子マネー ¥0

Account Balance;
-Total Assets
-Bank Account
-Credit Card
-Electronic money

Zaim (8M users)



OCR for
Shopping
receipt

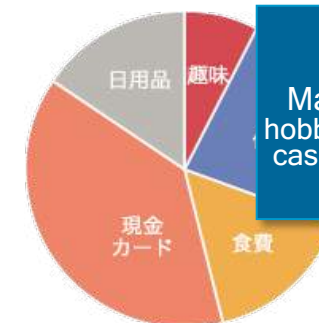
合計 ¥730

日付 2016年2月10日(水) 0時

電話番号 0423626521

お店 十全交通株式会社

交通 タクシー



Financial
Portfolio
Management;
hobby/house/food/
cash & card/daily
goods

Japan

TECHNICAL STANDARDS AVAILABLE

Each bank makes their own decision in contracting FinTech service providers and security checks in API connect. Unless there is a baseline established, it will be a big burden both for banks and FinTech service providers. To have a smooth collaboration between both parties, JBA & FISC provide several documents regarding contracts and electronic message specifications as follows.

Report for Review Committee on Open APIs by JBA (2017 July)

Summarize **principals for Open APIs**; API specifications standards, API security measure or protection of users.

Electronic message specification Standards for banking Open APIs by JBA (2018 Dec, ver.2)

Define **electronic message specification Standards in data transaction utilizing Open APIs** in order to have smooth system development for API linkage between banks and FinTech service providers.

Sample clauses for API Use Agreements pursuant to the Banking Act by JBA (2018 Dec, ver.1)

Summarize **sample clauses or descriptions which should be included in contracts** between banks and FinTech service providers to clarify contact terms for API usage.

API Connection Check List; revised version by FISC (2018 Oct)

Define communication tools between banks and FinTech service providers when establishing API connections in order to have smooth **security check for securing data connection**.

Japan

COMPARISON BETWEEN JAPAN AND PSD2 IN TECHNICAL POINTS (1/2)

	UK	Berlin Group	Japan	Comment
Authentication Steps	STEP1(Intent)→2(Consent)→3(Execution)	STEP1→2	STEP2 STEP2→3	➤ API is stateless, so 3 steps by state management are ideal
Communication Security	TLS	TLS	TLS Server Authentication + IP Filter TLS (3Mega Banks)	➤ In Japan, the adoption of TLS mutual authentication is delayed, spoofing and falsification measures are weak
Web site certificate	eIDAS + License Number	eIDAS + License Number	EV Certificate	➤ Private certificate does not correspond to license number We should also add a certificate to TPP credentials
Message Security	JWS Signature	HTTP Signature (Option)	No	➤ When calling the bank API directly from a smartphone, it is necessary to prevent spoofing
Signature Certificate	eIDAS + License Number	eIDAS + License Number	No	➤ Private certificate does not correspond to license number We should also add a certificate to TPP credentials
TPP Qualification	NCA Register PRETA	NCA Register PRETA	FSA publishes TPP list on its own HP	➤ In PSD2, private organizations like PRETA provide up-to-date (within 1 hour) information on TPP qualifications

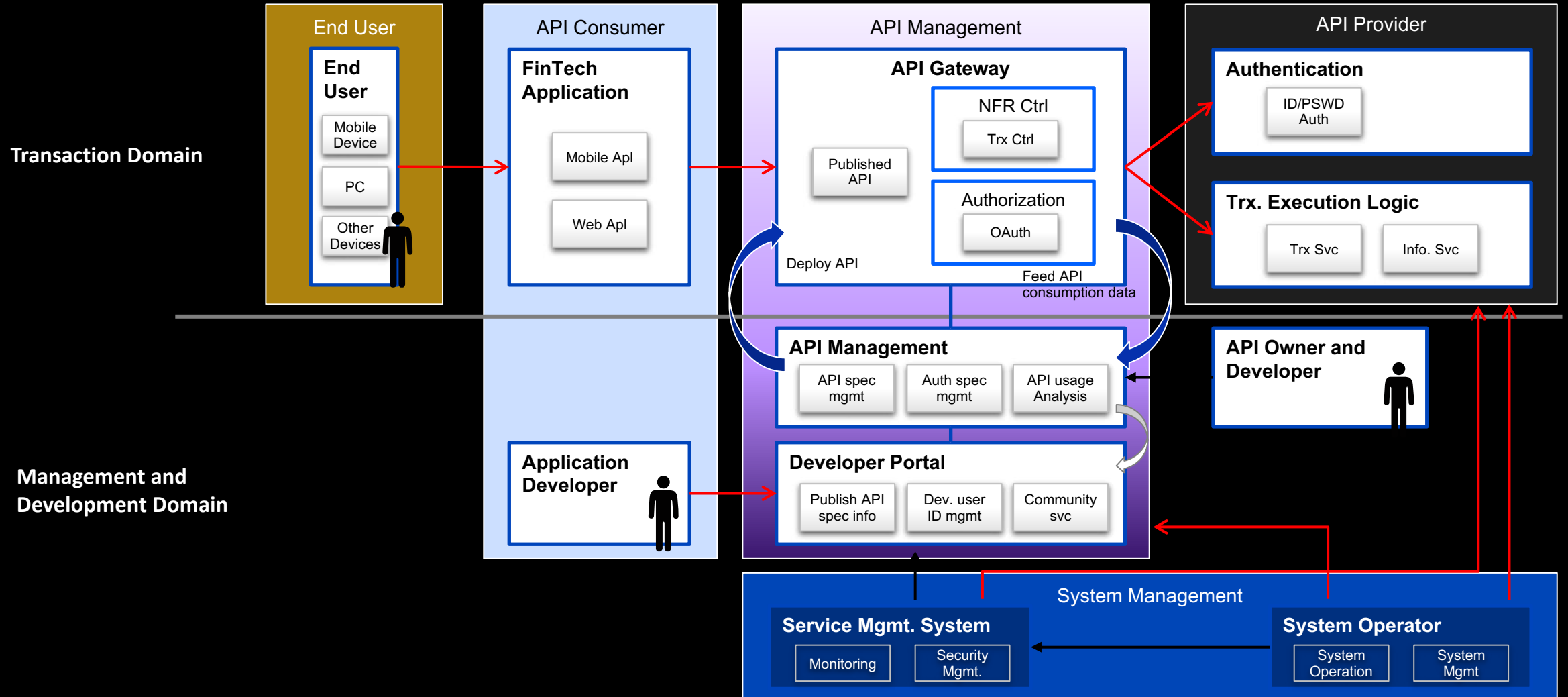
Japan

COMPARISON BETWEEN JAPAN AND PSD2 IN TECHNICAL POINTS (1/2)

	UK	Berlin Group	Japan	Comment
Fraud monitoring	Required for SCA exemption Duty to report to NCA	Required for SCA exemption Duty to report to NCA	FISC	It is better to add the SCA exemption cancellation by fraud to the connected company's qualification information
Authentication	OIDC	OAuth + PKCE	OAuth	When calling the bank API directly from a smartphone, it is necessary to prevent spoofing
SCA Exemption rule	RTS	RTS	No	Each bank defines its own in Japan
Order Information Management	Yes	Yes	No	API is stateless, so state management is ideal
API Specification	Financial API	XS2A	JBA Guideline	Each bank defines its own in Japan IBM Japan vs NTT Data
API use case	AISP, PISP, Credit Card	AISP, PISP, Credit Card	AISP,PISP	Realtime settlement by direct debit agreement with QR code is the mainstream use case in Japan Credit Card Industry is under MITI

Japan

REFERENCE ARCHITECTURE



Singapore

WHAT IS OPEN BANKING IN THE COUNTRY?

Open Banking in Singapore is the use of open APIs that enable third-party developers to build applications and services around the financial institution. This enables greater financial transparency options for account holders, allowing them to direct the use of their financial data where they see fit.

Currently in Singapore there is no specific data sharing or Open Banking legislation. However, the government provide a guideline for Open Banking APIs, which are defined via a publicly available infrastructure.

Timeline	Regulatory Initiative
2014	Smart Nation Singapore – The government was giving out money to encourage people to shift to digital payment, open data and payment.
2016	In November 2016, the Monetary Authority of Singapore (MAS), in collaboration with the Association of Banks in Singapore (ABS), published a comprehensive roadmap—Finance-as-a-Service: API Playbook—which, in effect, set the gold standard for regulatory advice on the topic in Asia. The playbook set out a comprehensive framework that introduced governance, implementation, use cases and design principles for application programming interfaces (APIs), together with a list of over 400 recommended APIs and over 5,600 processes for their development.
2017	Financial Industry API register: https://www.mas.gov.sg/development/fintech/financial-industry-api-register

Singapore

WHAT IS OPEN BANKING IN THE COUNTRY?



A TIMELINE OF INITIATIVES

Regulatory Initiatives

Nov 2014

Smart Nation Singapore Government initiative to drive adoption of digital and smart technologies – starting with open data and payments

Nov 2016

MAS & ABS Guidelines, standards for APIs, Information security standards and a comprehensive list of APIs available (400+) and 5600 processes. MAS also opened 12 APIs of their own.

May 2017

ASEAN FinTech Innovation Network (AFIN)
The AFIN initiative looks to support fintech and bank integration. To foster ecosystem cohesiveness, an API Directory and Industry Sandbox will be launched in 2018.

Sept 2017

Network for Electronic Transfers (NETS)
Singapore nationwide payments services launched their own eWallet, NETSPay.

Market Initiatives

Mid 2015

DBS Bank Innovation Plan with 1000+ experiments in API, cloud computing, microservice architecture & machine learning

May 2016

OCBC Bank CONNECT2OCBC was launched, the first open API developer platform in Asia

Nov 2016

Citi Bank Singapore Global Developer Hub opened its first platform in Singapore. There are 8 APIs enabling 51 operations.

Feb 2017

Standard Chartered Launched their developer sandbox globally as well as The GoodLife 'deal finder' specifically for Singaporean clients.

Nov 2017

DBS Bank Launched the largest API platform in the world with more than 20 categories

Aug 2018

United Overseas Bank UOB announces their intent to launch an open, digital-only bank.

Singapore

TECHNICAL STANDARDS AVAILABLE & MARKET ADOPTIONS

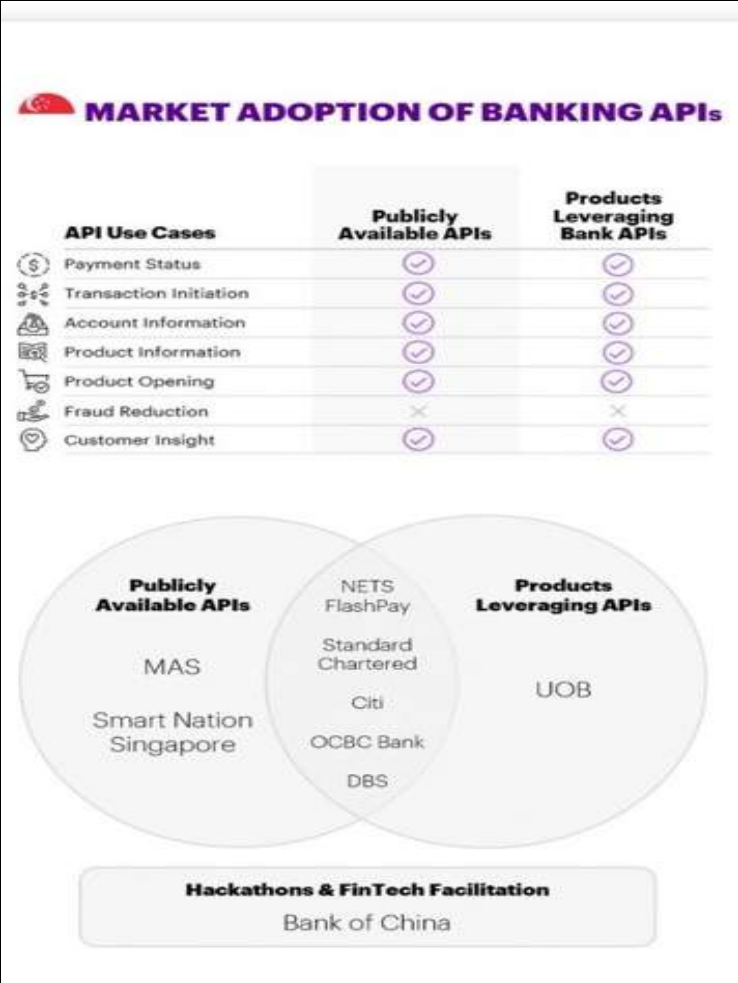
Current Technical Standards:

[Financial Industry API Register](#)

[ABS-MAS API Playbook](#)

- API Exchange (APIX) is a open-architecture API marketplace and sandbox platform for collaboration between Fintechs and financial institutions in which participants can integrate and test solutions with each other via a cloud-based architecture.

Singapore’s early participants are outlined below.



Sri Lanka

WHAT IS OPEN BANKING IN THE COUNTRY?

- Currently in Sri Lanka there is no government framework for Open Banking. However, legislation has been proposed surrounding Open Banking and data protection. The proposed legislation builds upon PSD2, Australian and Singaporean Open Banking frameworks. Additionally, the central bank of Sri Lanka plans to setup a fintech regulatory sandbox where any Banking, Financial Services, and Insurance (BFSI) institutions can build Open Banking apps using the infrastructure which will comply with the government proposed framework.
 - A Sri Lankan software company called WSO2 has been one of the early drivers of Open Banking momentum in Sri Lanka. With their opensource offering, some of the key banks already transitioned their platforms to enable Open Banking. This namely includes, Nations Trust Bank, Cargills Bank, HSBC, Standard charted, Union Bank, Peoples Bank, Sampath Bank. Many of these ADIs are already in the process to transition their architecture to be agile to adapt to Open Banking models for a number of years.
- No specific legislation, regulator or data sharing/ Open Banking rules
 - [Proposed Data Protection Bill](#) is being tabled through parliament

Technical standards available:

[Central Bank Fintech regulatory sandbox](#)

Oceania

Australia	49
New Zealand	55

Australia

WHAT IS OPEN BANKING IN THE COUNTRY?

In Australia, Open Banking is the provision of third-party access to customer, product, transaction and account information in a read-only format through the use of APIs, which formally gives consumers ownership of their data and provides them with the means to direct its use, in a seamless, simple and secure manner. The intent here is to increase competition in the Australian Banking market, in order to promote innovation and a greater customer focus in the industry.

In 2018, the Australian government announced its adoption of recommendations from the Farrell Report which proposed similar opening up of banking data, but with a broader scope, than what is embraced by PSD2. Underpinning Open Banking in Australia, the government established the Consumer Data Right (CDR), which is legislation to give Australians greater control over their data in general.

In 2019, the Commonwealth Scientific and Industrial Research Organization's (CSIRO) Data61 has been appointed as the Data Standards Body (DSB) for the CDR regime. These standards have been prepared by the Data Standards Body.

In late 2019, v1.0.0 of the CDR specifications for implementation were finalized and are to be implemented through a phased approach between 2020 and 2022. The phased approach is two-fold, with the major Australian banks required to expose their data in 2020, 6-12 months earlier than all other ADIs.

Beyond 2022, the CDR is expected to further extend legislation to include 'write access' to banking data, with other industry sectors set to follow suit.

Australia

WHAT IS UNIQUE TO OPEN BANKING IN THE COUNTRY

Australia has several features of their Open Banking model that are unique to other markets around the world, including:

Customer Experience Guidelines – As part of the Australian Open Banking environment, the ACCC (regulator) has undergone consumer testing and experience guidelines research to provide recommendations to the market surrounding what the Open Banking customer flows and consent experience should look like. This is a major differentiator in the Australian framework, so that the Open Banking experience between banks does not become fragmented.

Not Just Banking – The Australian CDR legislation is intended to be applied sector by sector across the whole economy, beginning in the banking, energy and telecommunications sectors.

Exposing Data Related to Payees and Direct Debits - Open Banking in Australia provides the opportunity for a Bank to automate the transfer of Payees and Direct debits from competitors banks and therefore alleviate the pain point and anxiety surrounding switching banks, which improves the onboarding experience.

Australia

REGULATORS AND ANY REGULATIONS ISSUED

- **Australian Competition and Consumer Commission (ACCC)** has been appointed as the regulator (circa 2019)
- **Consumer Data Right (CDR) & Consumer Data Standards (CDS)** as the functional and technical regulations (circa 2019)
- **CSIRO's Data61** has been appointed as the Data Standards Body (DSB) to work with the ACCC and produce the associated regulation

Australia

TECHNICAL STANDARDS AVAILABLE

- Australian CDS
- Australian CDR Registry
- Australian Customer Experience Guidelines

CDR Rules

These rules set out details of how the Consumer Data Right works

Part 2 of these rules deals with product data requests

Part 3 of these rules deals with consumer data requests that are made by CDR consumers. Only CDR consumers who are eligible to do so may make such requests. Schedule 3 to these rules sets out eligibility criteria for the banking sector.

Part 4 of these rules deals with consumer data requests that are made by accredited persons on behalf of such eligible CDR consumers.

Part 5 of these rules deals with how persons can become accredited persons. It also deals with ancillary matters, such as revocation and suspension of accreditation, obligations of accredited persons, and the Register of Accredited Persons.

Part 6 of these rules deals with dispute resolution.

Part 7 of these rules deals with rules relating to the privacy safeguards. Part 7 also sets out some additional civil penalty provisions that protect the privacy or confidentiality of CDR consumers' CDR data.

Part 8 of these rules deals with data standards.

Part 9 of these rules deals with miscellaneous matters, such as review of decisions, reporting, record keeping and audit, and civil penalty provisions of the consumer data rules

Australia

USE CASES & CONSUMER ADOPTIONS

All ADI's are required to share read-only transaction, account, customer and product reference data.

No implemented Use Cases are referenceable, though the Australian GBS practice have some strong and unique thoughts around future Use Cases.

Consumer Sentiment - Open Banking compliance is yet to go live in Australia, however the sentiment from the market and our clients is that it will be a slow uptake, followed by a more aggressive uptake.

Industry Challenge – Compliance readiness has been the current focus of the market, as exposing APIs from legacy systems has proven to be a greater challenge than initially anticipated. This has resulted in a shift in focus away from delivering value.

Simple switching between Banks (Payees and Direct Debits)

- IBM's experience with our global clients have shown us that a main pain point for switching banks for customers is the manual effort required to change payees and direct debits. Australian Open Banking provides the opportunity for a Bank to automate the transfer of Payees and Direct debits from competitors banks and therefore alleviate the pain point and anxiety surrounding switching banks. This improves the customer experience for on-boarding.

Business Banking – Business Insights

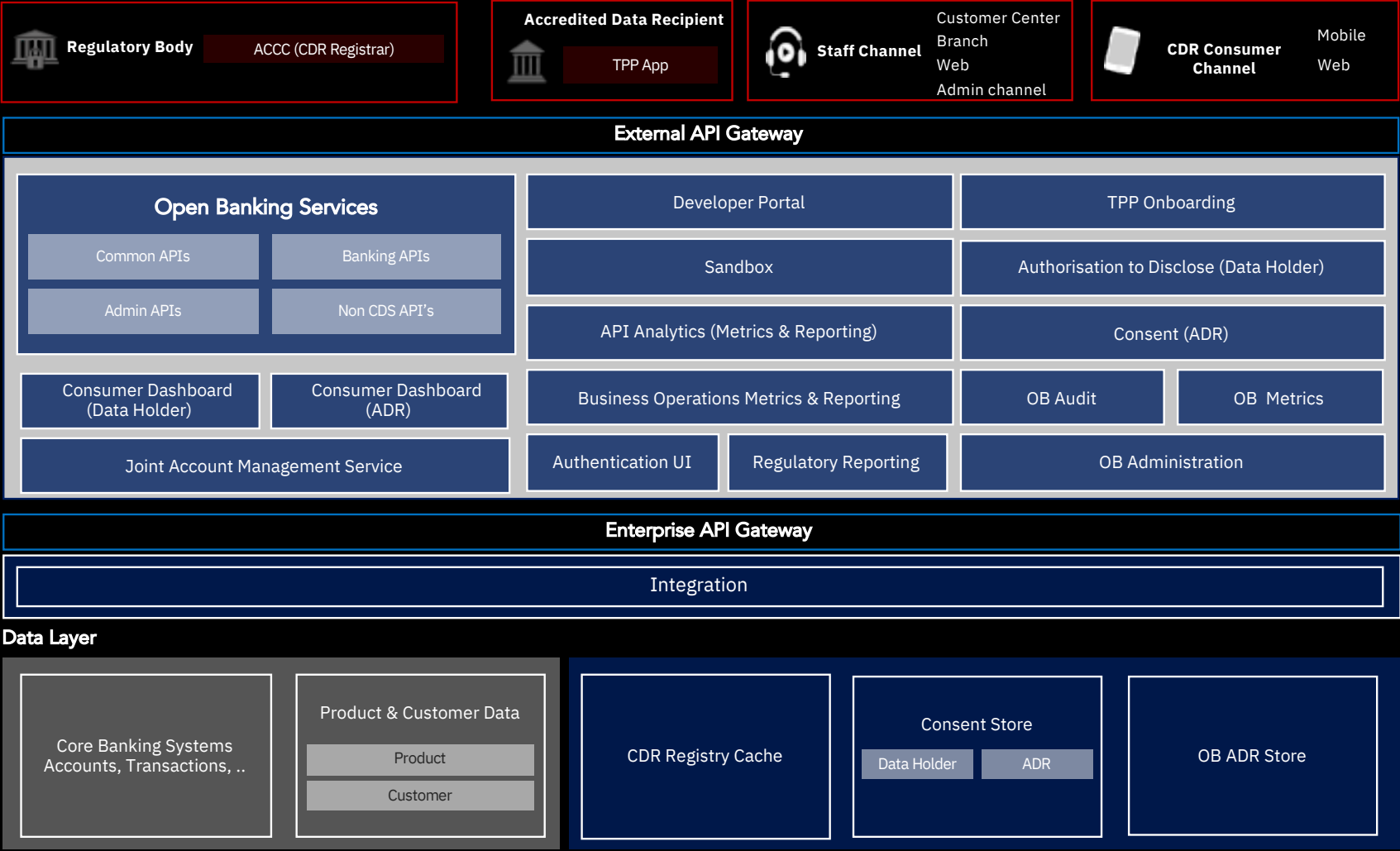
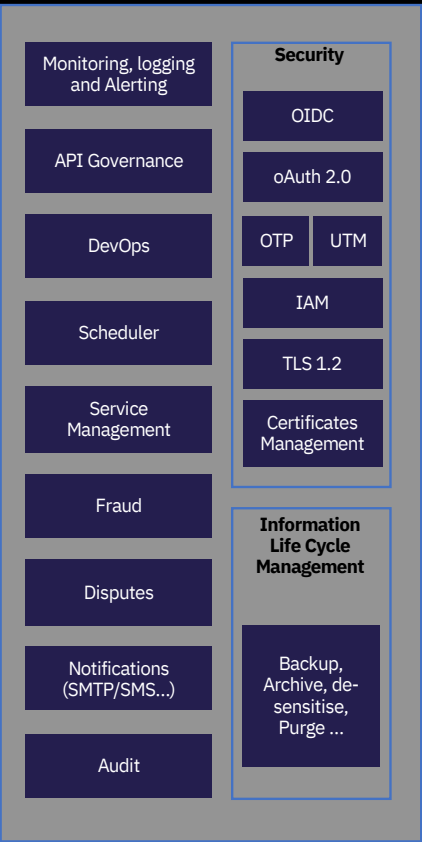
- IBM's deep customer research has highlighted that there is a strong potential to leverage Open Banking insights for small to medium businesses. Open Banking provides the opportunity for Banks to explore new ways to provide value-added insights to their small to medium business market. By utilizing business transaction data, Open Banking provides the potential to offer their small to medium business customers with greater insights into their performance against a market aggregate of other businesses in the same industry or geographical location. This provides a unique perspective that would otherwise be unknown for owners of these businesses. IBM's initial assessments indicate an untapped market for monetization opportunities in the business banking space.



Australia

TECHNICAL ARCHITECTURE

Enterprise Core Capabilities



New Zealand

WHAT IS OPEN BANKING IN THE COUNTRY?

New Zealand currently has an active Open Banking initiative in motion, under the name [PaymentsNZ](#). Their Open Banking specification covers both account data access and payments

In 2010, the New Zealand payments industry recognised significant benefits in having common API standards and a shared framework to support their ongoing use and development. In 2017, industry discussions led to a set of guiding principles and objectives for such a service and the subsequent creation of an independent API Centre. With considerable experience in standards development, management and governance, and having facilitated the API initiative, Payments NZ was asked to set up and manage the API Centre on behalf of the industry.

Standards were first published March 1st 2019.

The Payments NZ Board is responsible for the corporate governance of the API Centre. However, most of the governance responsibilities have been delegated to the API Council, which includes an independent sub-committee to deal with sensitive issues. The API Business Group and API Technical Group are directed by the API Council, which in turn receives recommendations from these two groups. As the provider of the service, Payments NZ is responsible for the day-to-day operations of the API Centre. Any contractual arrangements are with Payments NZ and all fees are paid to Payments NZ.

New Zealand

CONSUMER ADOPTIONS

Open Banking in NZ has been extremely slow since its inception and no unique Use Cases or strong market adoptions have been noted since it's first inception in 2010.

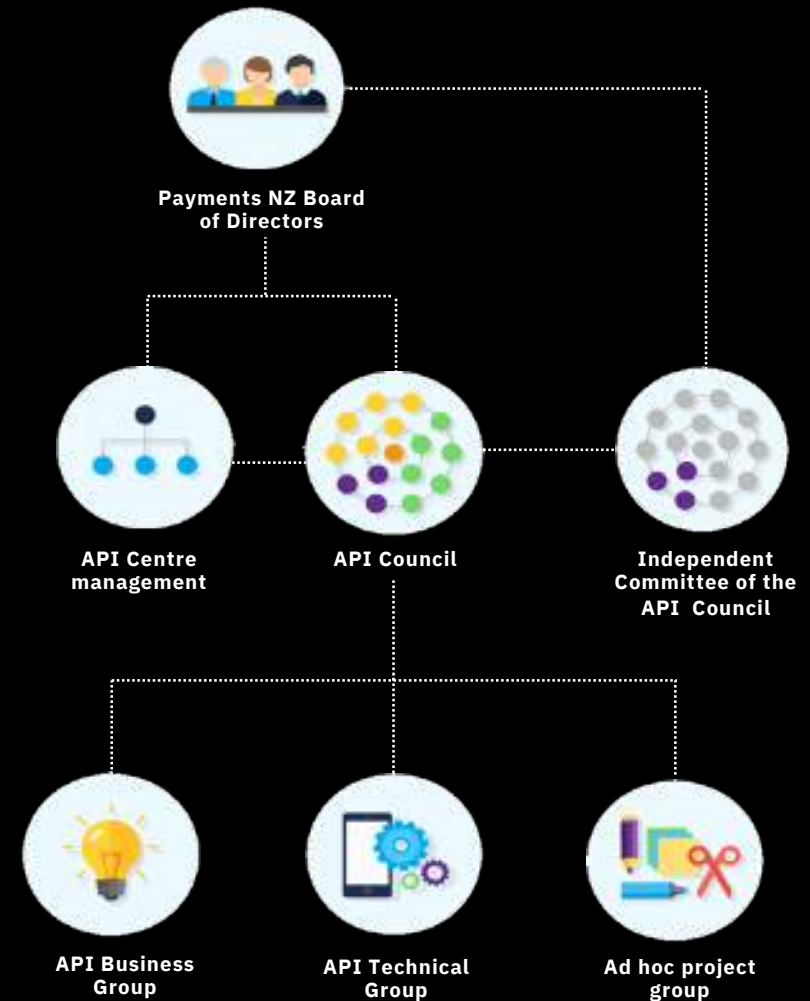
Recent years have outlined a stronger demand from industry incumbents, but this is notably slower than progress made through the Asian region and the world.



New Zealand

REGULATORS & REGULATIONS ISSUED

- No specific legislation, regulator or data sharing/ Open Banking rules
- The Payments NZ API Centre develops, maintains and publishes payment-related API standards for New Zealand
- The Payments NZ Board is responsible for the corporate governance of the API Centre. However, most of the governance responsibilities have been delegated to the API Council



Americas

United States of America	59
Canada	66
Brazil	69

United States of America

WHAT IS OPEN BANKING IN THE COUNTRY?

- Open Banking in North America is defined by growing consumer demand, but without any accompanying legislative mandate
- As result most Open Banking players have focused on making APIs available, but without common standards
 - From a B2B perspective, banks are most interested in using their APIs to embed inside their customers ERP systems PFM (personal financial management) applications thereby making their products stickier
 - From a consumer perspective the range of APIs is more limited
 - Pseudo standards are emerging, e.g. Financial Data Exchange (FDX), BIAN, ISO20022 for payments
- This has created a strong demand for consolidators who can provide a single interface to consumers with high value services while doing the hard work of wiring together and normalizing the various API variants
 - E.g. Yodlee and Plaid which claim access to many of institutions through a brokered interface
 - This reduces friction and provides a unified view of multiple bank relationships and consolidated “real-time” financial position
- At the same time tech firms including Google, Apple and Facebook are testing how to establish their own payment and financial ecosystems
 - While not “open” they aim to offer many of the same services working with partner banks
 - For example, Apple Pay extends the payment options, but doesn't attempt to consolidate wallets or promote interoperability with other payment players such as Venmo

United States of America

REGULATORS & REGULATIONS ISSUED

Banking regulators

- Consumer Financial Protection Bureau (CFPB)
- Federal Financial Institutions Examination Council (FFIEC)
- Office of the Comptroller of the Currency

Consumer Protection Principles Consumer-Authorized Financial Data Sharing and Aggregation

Consumer-authorized access and use of consumer financial account data may enable the development of innovative and improved financial products and services, increase competition in financial markets, and empower consumers to take greater control of their financial lives. To accomplish these objectives, however, such access and use must be designed and implemented to serve and protect consumers. The Bureau intends for the following Consumer Protection Principles to help safeguard consumer interests as the consumer-authorized aggregation services market develops.

- Principles For Consumer-Authorized Financial Data Sharing and Aggregation
- Consumer-authorized financial data sharing and aggregation Stakeholder insights



October 18, 2017

Consumer Protection Principles: Consumer-Authorized Financial Data Sharing and Aggregation

In the Dodd-Frank Act, Congress instructed the Bureau to implement and enforce consumer financial law “for the purpose of ensuring that all consumers have access to markets for consumer financial products and services and that markets for consumer financial products and services are fair, transparent, and competitive.”¹ Congress further instructed the Bureau to exercise its authorities so that “markets for consumer financial products and services operate transparently and efficiently to facilitate access and innovation.”²

For some time, a range of companies—many of them “fintech” companies—have been accessing consumer account data with consumers’ authorization and providing services to consumers using data from the consumers’ various financial accounts. Such “data aggregation”-based services include the provision of financial advice or financial management tools, the verification of accounts and transactions, the facilitation of underwriting or fraud-screening, and a range of other functions. This type of consumer-authorized data access and aggregation holds the promise of improved and innovative consumer financial products and services, enhanced control for consumers over their financial lives, and increased competition in the provision of financial services to consumers.

There are many significant consumer protection challenges to be considered—particularly with respect to data privacy and security—as these technologies and practices continue to develop. In part through a November 2016 public Request for Information, the Bureau is aware that a range of industry stakeholders are working, through a variety of individual arrangements as well as broader industry initiatives, on agreements, systems, and standards for data access, aggregation, use, redistribution, and disposal. The Bureau believes that consumer interests must be the priority of all stakeholders as the aggregation services-related market develops. A common understanding of consumer interests is essential so that effective consumer protections can be integrated consistently into this market.

As a result, the Bureau today is releasing a set of Consumer Protection Principles intended to reiterate the importance of consumer interests to all stakeholders in the developing market for services based on the consumer-authorized use of financial data. The Principles express the Bureau’s vision for realizing a robust, safe, and workable data aggregation market that gives consumers protection, usefulness, and value.

¹ 12 U.S.C. 5511(a).

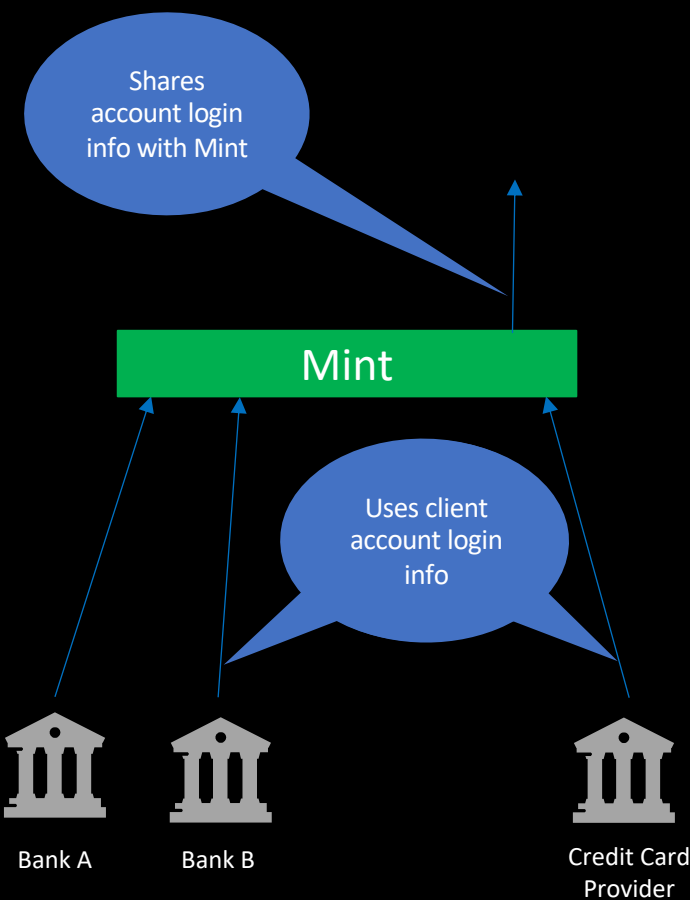
² 12 U.S.C. 5511(b)(5).

United States of America

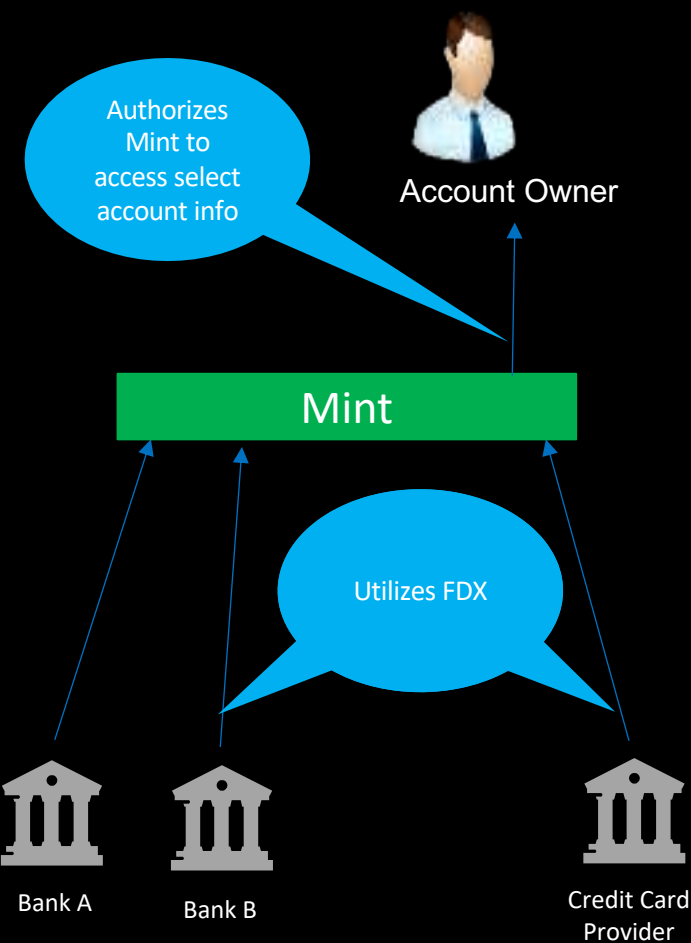
USE CASES

Account Aggregation by Mint

Today



Open Banking Enabled World



Key points

- Clients want everything together from balances and bills to credit score and more.
- They want their financial life, in one place that's easy to understand.

What are banks exploring?

- Using "open banking" type standards such as FDX for account aggregation with authorized users.

United States of America

USE CASES

In addition to the Account Aggregation use case

Image Retrieval - Property management companies to create a workflow by automatically retrieving returned checks each morning and routing the information to property managers to initiate the collections process

Push to Card - Insurance companies to disburse claims payments, electronic annuities or life insurance settlements

Wire Payment and Status - Corporate treasury teams to originate wires within a company's own accounting system, send cross-currency wires to pay foreign currency invoices, and reconcile faster for a quicker cash position

Get Bank Contact Information - allows originating financial institutions to quickly find and alert the appropriate contact within a receiving financial institution of potential fraud to prompt further investigation.

Get Transaction Status - allows an Originator of a transaction to check the status of a submitted payment instruction.

B2B Payments Interoperability - allows a company to obtain correct payment information and remittance requirements to pay another company.

Initiate Payment - allows businesses to submit payment instructions and track scheduling without having to access multiple systems.

Make an Appointment - Search locations, check available meeting times and schedule an appointment with a bank representative.

Intelligent Payment - Use a multi-rail payment engine with intelligent routing capabilities. Send payments via Zelle, ACH, RTP, and/or check.

United States of America

CONSUMER ADOPTIONS

- Limited adoption, challenged by ever changing APIs and security requirements from the mostly unwilling banks to whom the consumer connects
- Successful apps include Mint and YNAB, both offer the ability to create a single view of a user's accounts across multiple financial services providers
- FDX counts over 8 million consumers at the beginning of 2020, expected to be 12 million by April 2020

All Banks			US Banks	
	Sample Size	Value	Sample Size	Value
Not offered	18	4.0%	10	13.7%
Offered to some customers	66	14.7%	18	24.7%
Offered all customers	366	81.3%	45	61.6%
Total Sample Size	450 Banks Globally		73 US Banks	

[This data set](#) illustrates the extent banks offer Open Banking applications to their customers. Currently in the US consumer space we see Open Banking manifested in personal financial management tools and account aggregation services.

United States of America

CONSUMER ADOPTIONS

The US lacks a comprehensive technical standard. OFX is a legacy standard that was adopted by many Personal Financial Management (PFM) solutions. A new standard that is gaining traction is Financial Data Exchange (FDX). OFX joined FDX in 2019.

Financial Data Exchange (FDX)

- The Financial Data Exchange (FDX) is a non-profit financial industry organization dedicated to promoting and enhancing a common interoperable standard and operating framework for sharing consumer financial data
- Open to all financial institutions and fintech companies, FDX facilitates collaboration in the development, growth, and industry acceptance of the standard and security requirements
- FDX has 94 member companies as of 2/20/2020
- FDX is a subsidiary of FS-ISAC (Financial Services Information Sharing and Analysis Center), an industry consortium that connects nearly 7000 member financial institutions and more than 15,000 users in more than 70 jurisdictions, focusing on being the global financial industry's go to resource for cyber and physical threat intelligence analysis and sharing

United States of America

CONSUMER ADOPTIONS

More on FDX

FDX Member Survey - the October 31, 2019 member survey indicated that:

- 100% of our FI/Service Firm members responding have FDX API deployments in planning (pre-development), development, pilot, or in production.
- There are over 8 million consumers on FDX, the number is expected to be 12 million by April 2020.

> API Uptime

An uptime of nearly 100% means that costumers have access to their data when they need it.



> U.S. Customers on the FDX API

Our API is now protecting online financial data for more than five million consumers, proving the success of this industry-led initiative.



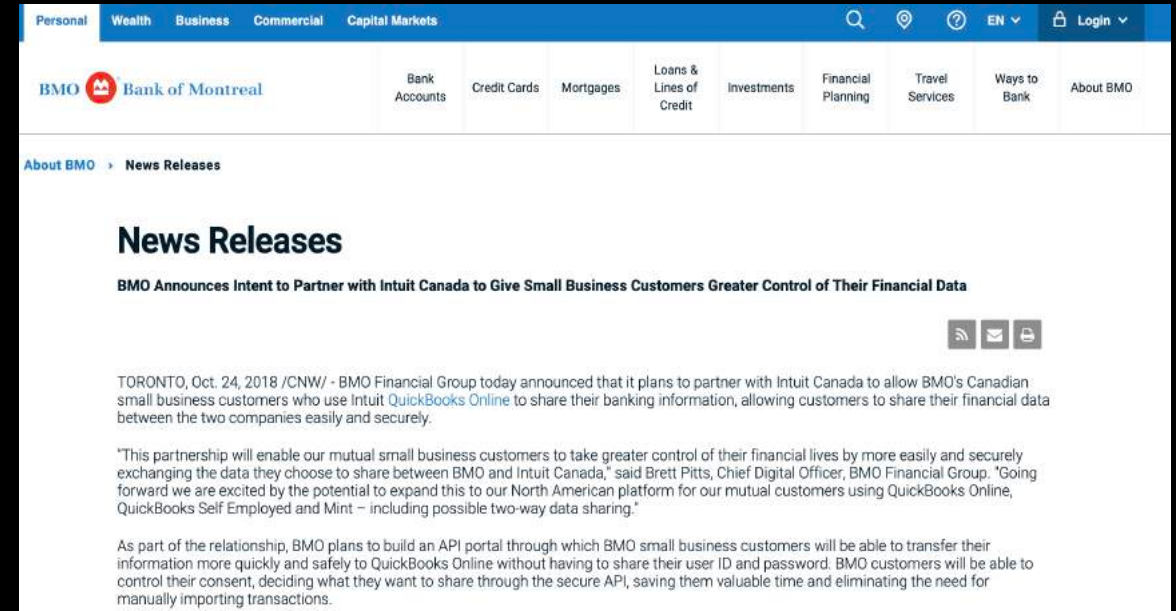
FDX API Specification (V4)

FDX V4.0 4.0.0 OAS3	
Financial Data Exchange V4.0 API	
Servers	
https://api.fl.com/idx/v4 - Financial Data Exchange V4.0 API	
Account Information	
GET	/accounts Search for accounts
GET	/accounts/{accountId} Get an account
Account Statements	
GET	/accounts/{accountId}/statements/{statementId} Get an account statement image
GET	/accounts/{accountId}/statements Search for statements
Account Transactions	
GET	/accounts/{accountId}/transaction-images/{imageId} Get account transaction image
GET	/accounts/{accountId}/transactions Search for account transactions
Meta	
GET	/availability Get API availability
GET	/capability Get API capability
Personal Information	
GET	/customers/current Get current authenticated customer information
Money Movement	
POST	/transfers Request account transfer
GET	/transfers/{transferId}/status Get transfer status
Tax Forms	
GET	/tax-forms Search tax forms
GET	/tax-forms/{taxFormId} Retrieve tax form
Submit Tax Forms	
POST	/tax-forms Create tax form
PUT	/tax-forms/{taxFormId} Update tax form

Canada

WHAT IS OPEN BANKING IN THE COUNTRY?

- Limited Open Banking initiatives in Canada
 - [Startups for Open Banking BMO Partners with Intuit Canada to Give Small Business Customers Greater Control of Their Financial Data](#)
 - Startups for Open Banking in Canada: Wealthica, Questrade, Flinks
- Regulatory framework not yet in place in Canada – not clear whether it will follow the European model (regulatory initiatives like PSD2, UK Open Banking standard) or align with US with a much more market oriented approach (NACHA APIs are not mandatory, and banks are still the gatekeepers of their customers' data)
- The federal government's 2018 budget calls for a review of Open Banking
 - The Government proposes to undertake a review of the merits of Open Banking in order to assess whether Open Banking would deliver positive results for Canadians with the highest regard for consumer privacy, data security and financial stability



Canada

REGULATORS & REGULATIONS ISSUED

No regulatory framework in place in Canada yet. List of related reviews on Open Banking in Canada

Canadian Budget 2018 – Review of Open Banking:

- <https://www.budget.gc.ca/2018/docs/plan/anx-03-en.html#Review-of-Open-Banking>

Open Banking: What It Means for You, 2019 Report of the Standing Senate Committee on Banking, Trade and Commerce

- https://sencanada.ca/content/sen/committee/421/BANC/Reports/BANC_SS-11_Report_Final_E.pdf

Under the Payment Clearing and Settlement Act, Financial Market Infrastructures (FMIs) that are considered to have the potential to pose systemic or payments system risk can be designated, and are subject to the Bank of Canada's oversight for risk management.

FMIs facilitate the clearing, settling, or recording of payments, securities, derivatives, and other financial transactions among participating institutions and financial brokers. Canadian Payments Act (1985):

- <https://laws-lois.justice.gc.ca/eng/acts/C-21/FullText.html>

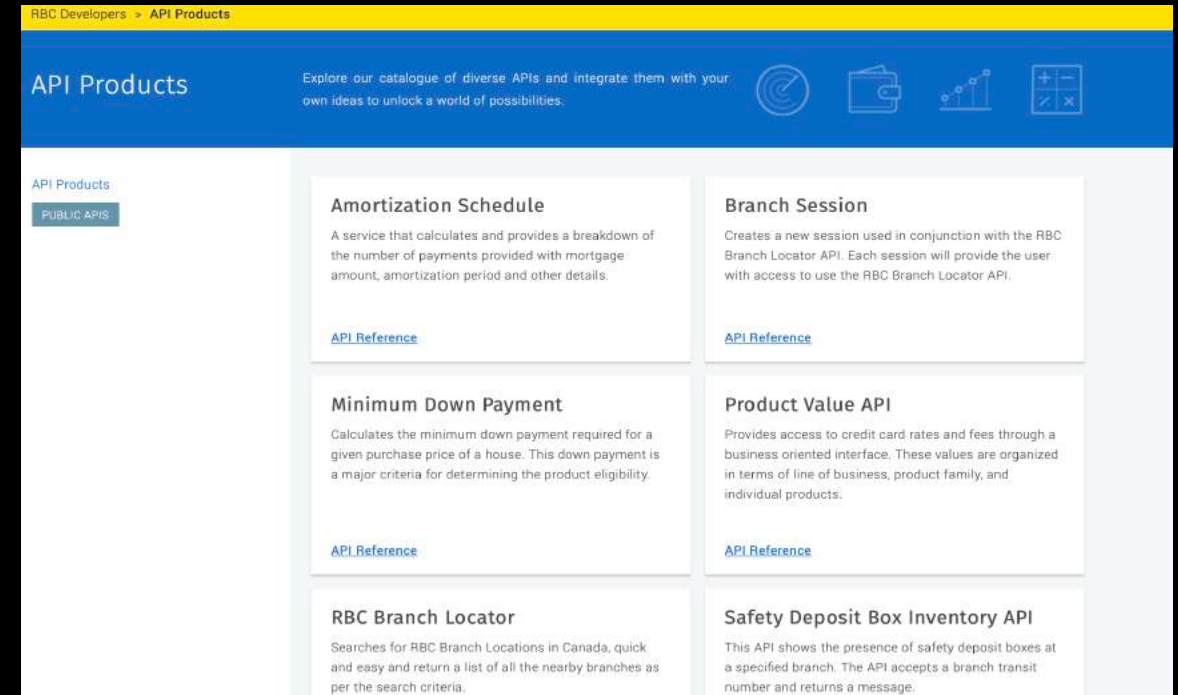
Canada

USE CASES & CONSUMER ADOPTIONS

Account aggregation – a consolidated view of all your financial information from multiple financial institutions: providing new insight about spending patterns, making recommendations about saving money, automating parts of the decision-making process

RBC APIs

- Amortization Schedule
- Branch Session
- Minimum Down Payment
- Product Value API
- RBC branch locator
- Safety Deposit Box Inventory API



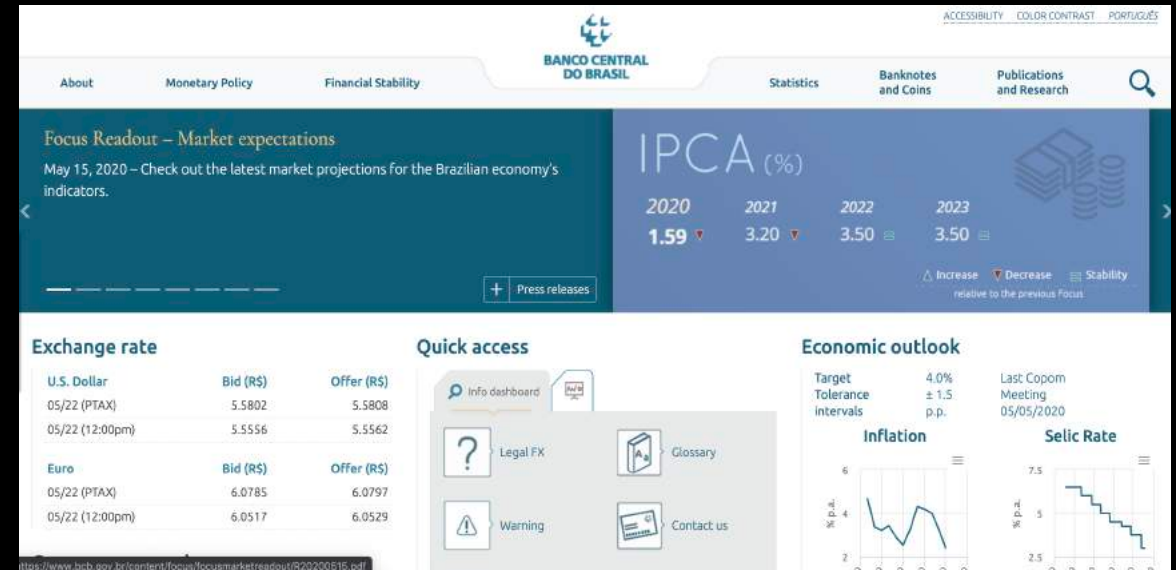
Brazil

WHAT IS OPEN BANKING IN THE COUNTRY?

Open Banking is an initiative being led by Banco Central do Brasil (BCB/Bacen) as the financial system regulator.

The financial system is dominated by five big traditional banks but 60% of the population is still unbanked, living outside of the system using cash mostly and having very limited access to financial products like loans and personal credit. The population that has access to credit faces the highest interest rates in the world.

Bacen's main objective is to foster competition among the five big banks, and also let new entrants such as Neo Banks and Fintechs to create opportunities for lower interest rates and more diverse financial products.



Brazil

REGULATORS & REGULATIONS ISSUED

- Bacen has been studying the matter for a while using mostly PSD2 as a reference, but also other experiences in Asia. Also the subject has been discussed with the broad society in niche events, to gather opinions and questions.
- On November 28th 2019, Bacen has issued a public consultation on the first draft of the regulation (73/2019), for comments and feedback. They have collected opinions from Banks, Financial Institutions, FinTechs, other industries and citizens in general through their website until January 31st.
- On May 4th, Bacen has published the first version of the regulation and an implementation calendar as follows:
 - Phase 1 (Nov 30th, 2020): participants must be able to share information about available products and services and provide access to data about channels, products and services related to Checking and Savings accounts, payments and credit;
 - Phase 2 (May 31st, 2021): participants must be able to share client's personal information (current and changes through time), and transactional data (accounts and credit);
 - Phase 3 (Aug 30th, 2021): participants must be able to initiate payments transactions, service of credit operations proposal between the participants;
 - Phase 4 (Oct 25th, 2021): participants must be able to provide information about currency exchange, investments, insurance and retirement funds.



Brazil

REGULATORS & REGULATIONS ISSUED

Initially only banks classified as tiers S1 and S2 (Regulation #4453/2017) need to comply to the Open Banking regulation. These are the main banks for each segment according to Bacen's website:

- Tier S1:
 - BANCO DO BRASIL (BB). • BRADESCO • BTG PACTUAL • CAIXA ECONÔMICA FEDERAL • ITAU • SANTANDER
- Tier S2:
 - BANRISUL • BANCO DO NORDESTE • BNDES • CITIBANK • CREDIT SUISSE • SAFRA • VOTORANTIM

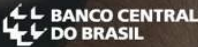
Additionally financial institutions that provide one or more services from the following list are allowed to participate as optional:

- Payments initialization
- Checking accounts



O QUE O BRASIL GANHA COM O
OPEN BANKING?

Acesso e conveniência
para o **cidadão**.
Eficiência, inovação
e competitividade
para o sistema
financeiro.

 BANCO CENTRAL
DO BRASIL

Brazil

USE CASES & CONSUMER ADOPTIONS

Initially the objective is to start by giving the customers ownership of information the banks have gathered over the years, so that the customers, not just the banks, can start to take advantage of this historical information. The customers can share their information on deposit, savings, loans, mortgages, credit cards, insurances, etc., with any financial institutions to get better pricing for products because of competition or better credit scoring using the historical data that was previously locked in one financial institution. Also personal information such as name, address, ID, and others will be shared to speed up the servicing process, and to create new KYC services.

Fostering competition means also opening the market for new entrants. One that started ahead of others is Guia Bolso, that has created an account and credit card aggregation service, providing financial guidance for its clients. Guia Bolso also offers many personal credit options with lower rates compared to traditional banks.

Instant payments is another initiative that is planned to go to production in November 2020, It allows new entrants to initiate payments on savings and deposit accounts, for individuals and businesses. In this context, the business of traditional card issuers and related companies are threatened. Bacen expects to increase the inclusion of the unbanked in the financial system, hoping that new business models and services will flourish, and making the citizen lives more secure as they will not need to use cash exclusively in their day-to-day lives.

Monetization

- All banks and stablished financial institutions consider Open Banking primarily as a threat to their current business models. They will not have the option of not participating in Open Banking as it is mandatory by the regulator.
- Most of the discussions are centered around how to monetize the information shared

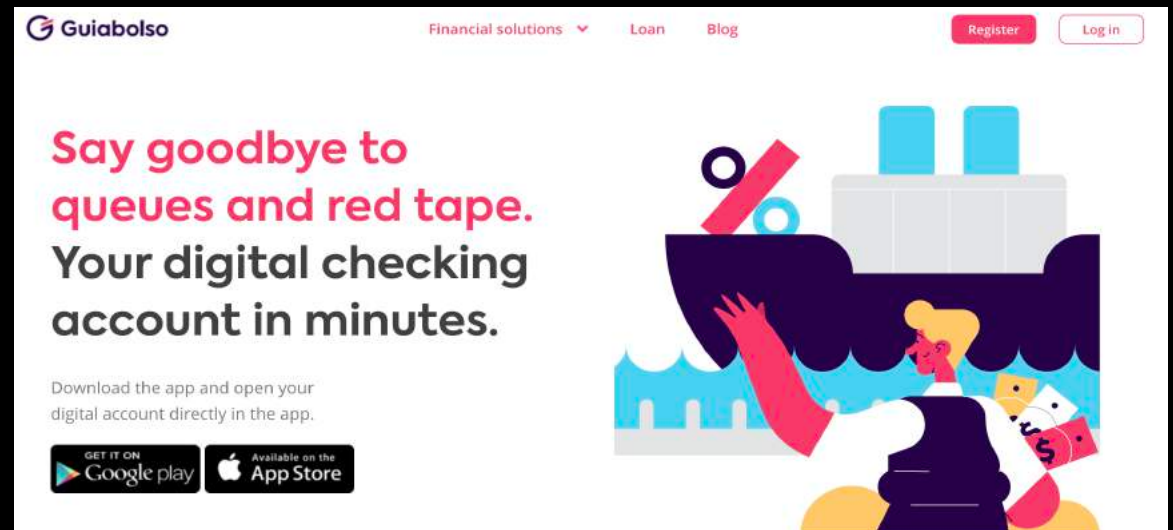
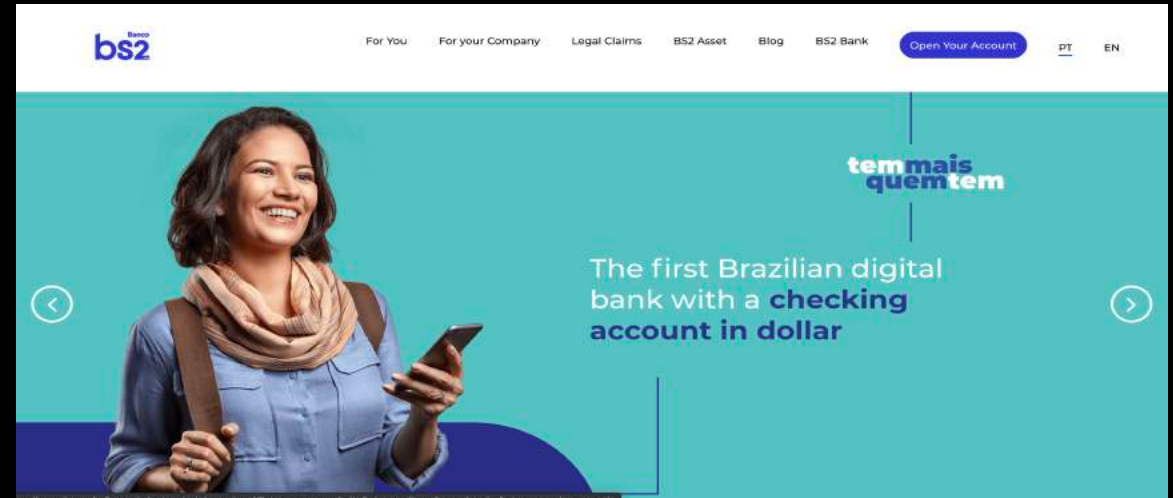
Brazil

TECHNICAL STANDARDS & REPORTING REQUIREMENTS

There are initially no standards offered by Bacen, as the strategy is to let the market decide what works best

Participants are concerned, as an agreed standard by all the parties will take time to be defined, if ever defined. Possibly the companies that start first will create the most successful candidates for the standard.

There are already some pilots in production, such as Guia Bolso, Original, Banco do Brasil and BS2 – mostly providing basic checking account information, inspired by some existing messaging standards such as ISO20022.

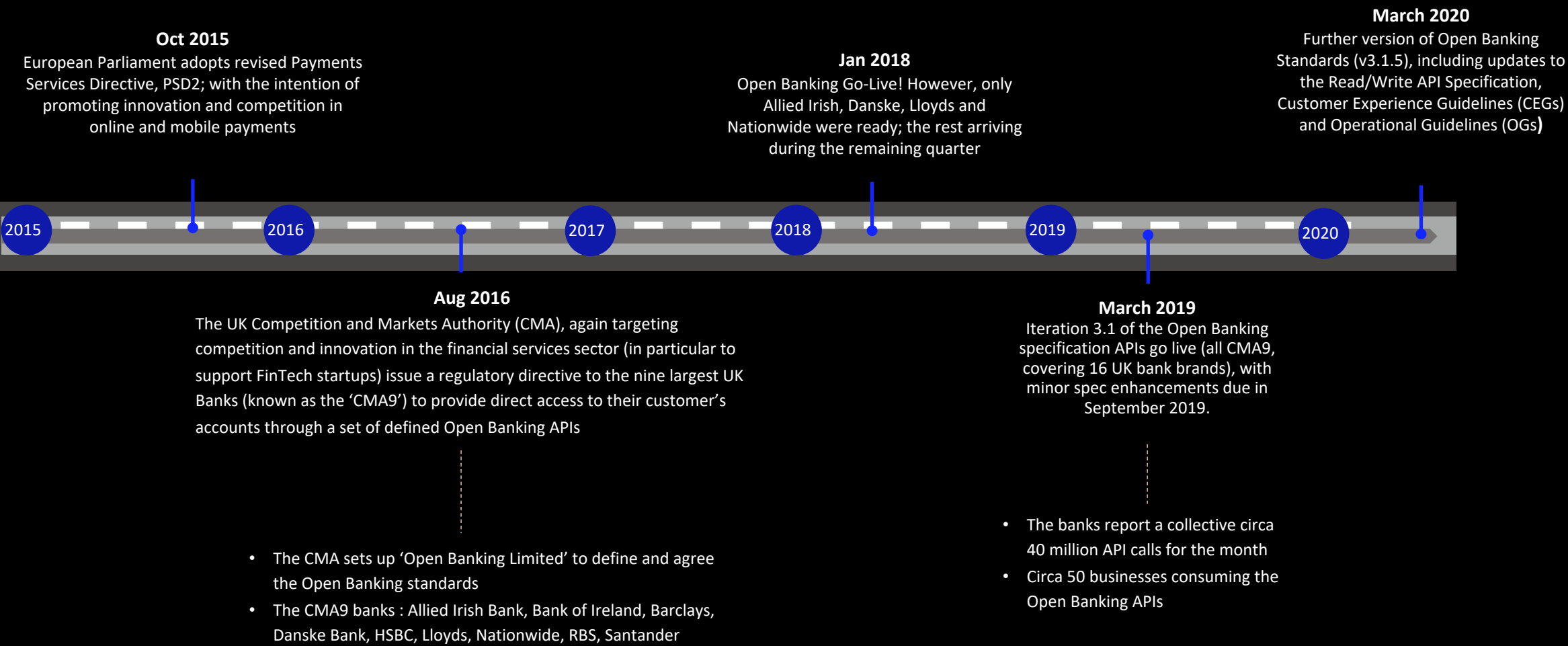


Europe

United Kingdom	75
Spain	80
Italy	86
Ireland	87
France	88
Germany, Austria, Switzerland	91

United Kingdom

WHAT IS OPEN BANKING IN THE COUNTRY?



United Kingdom

WHAT IS OPEN BANKING IN THE COUNTRY?

Current Status

- CMA9 all live as ASPSPs @ v3.x of regulatory APIs (albeit with some teething troubles !)
- In addition, there are circa 40 voluntary registered ASPSPs which are at various states of functionality / connectivity
See <https://www.openbanking.org.uk/provider-categories/account-providers/>
- Dependent on source, there are between 100 – 300 active Third Party Providers (TPPs) entered in the market, consuming Open Banking APIs to enhance their consumer propositions
See <https://www.openbanking.org.uk/provider-categories/third-party-providers/>
- All UK major banks (in role of TPP) have launched account aggregation based propositions integrated to either/both their Banking App / Internet Channel (largely driven by a need to learn, been seen adopting the APIs and a minimum 'table stakes' for leading bank digital propositions)
- Payments haven't really picked up yet. So far, the majority of the eco-system has focused on propositions around AISP functionality
- There's no 'killer app' (yet)

United Kingdom

REGULATORS & REGULATIONS ISSUED

EBA and PSD2 Related

- [PSD2 Directive Specification](#)
- [Regulation on Capped Interchange Fee](#)
- [Draft for RTS/ Strong Customer Authentication](#)
- [TPP Indemnity Insurance Requirements](#)
- [TPP Authorisation and Registration](#)
- [PRETA – European Directory](#)
- [STET – PSD2 Standards](#)
- [EBA Guidelines on outsourcing arrangements](#)

CMA and UK Open Banking Related

- [UK's Open Banking Standard](#)
- [CMA's Implementation Entity Steering Group](#)
- [CMAs Published Read-Write APIs \(Github\)](#)
- [Banks API Dashboard](#)

United Kingdom

REGULATORS & REGULATIONS ISSUED

Reporting Requirements

- New Regulation Requirements for Incident Notification apply from January 2018
 - Article 96 of Directive (EU) 2015/2366 on payment services in the internal market (PSD2) requires payment service providers to establish a framework to maintain effective incident management procedures, including for the detection and classification of major operational or security incidents. These Guidelines apply from 13 January 2018.
- Need to Classify Incidents
 - These Guidelines apply in relation to the classification and reporting of major operational or security incidents in accordance with Article 96 of Directive (EU) 2015/2366. These Guidelines apply to all incidents included under the definition of 'major operational or security incident', which covers both external and internal events that could be either malicious or accidental.
- Need to notify within 4 hour (initial)
 - Payment service providers should use the same template to inform the competent authority throughout the lifetime of the incident (i.e. for initial, intermediate and final reports) Payment service providers should send the initial report to the competent authority within 4 hours from the moment the major operational or security incident was first detected.

- Secure Systems Approach
 - Payment service providers should at all times preserve the confidentiality and integrity of the information exchanged with the competent authority in their home Member State and also authenticate themselves properly towards the competent authority in their home Member State.
- [Financial penalties for non-compliance.](#)
 - UK Government current proposal is up to 4% of revenues under new Cyber Regulation (NIS Directive) due in May 2018. Other countries still defining their penalty regimes. All 28 countries in EU will have penalties. This is additional to GDPR (Data Protection Laws) which come into effect also in 2018 and have additional reporting requirements to Data Protection Authorities.

Reporting Requirements

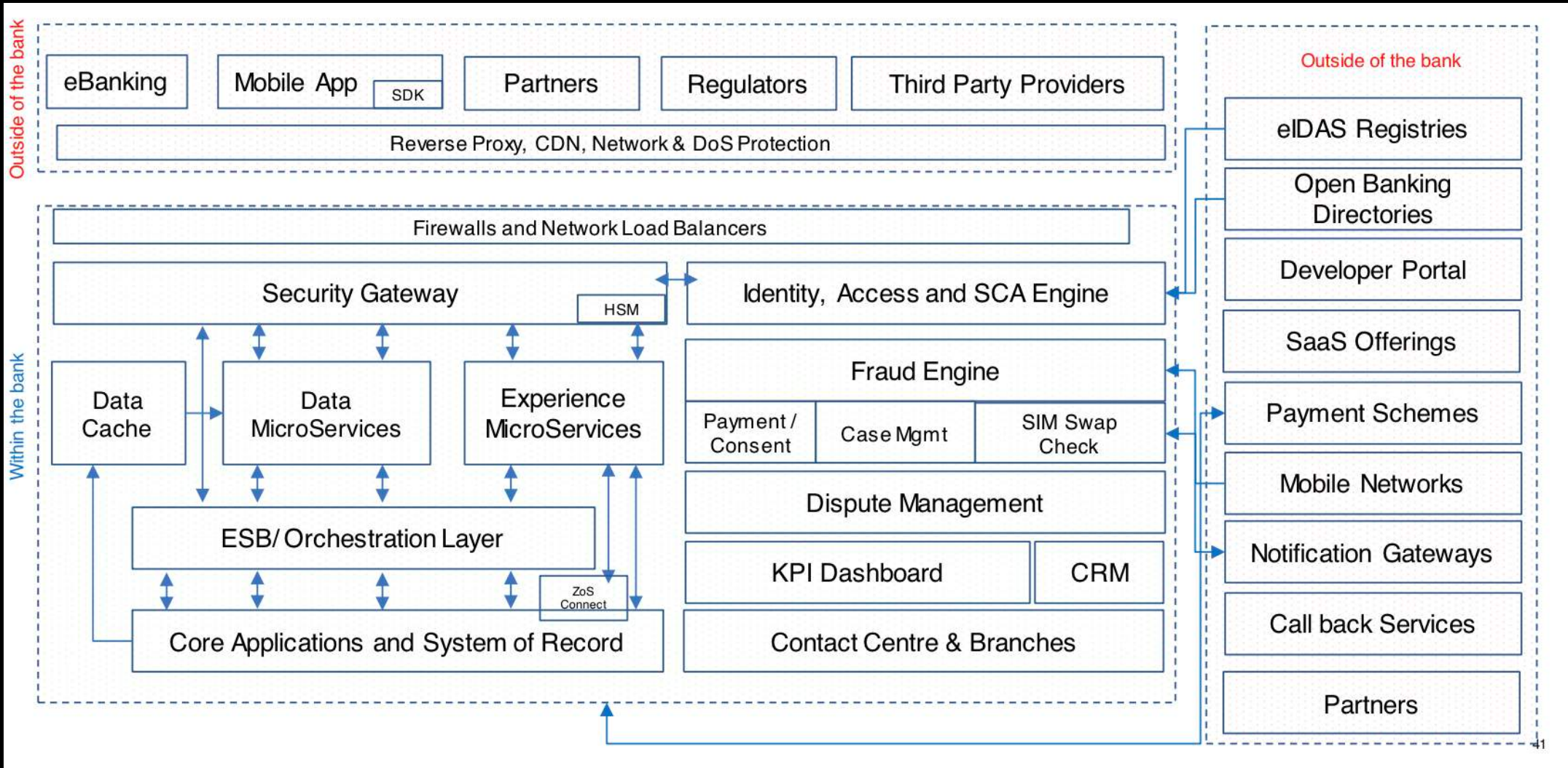
Example - European Banking Authority (EBA) Payment Services Directive (PSD2) Incident Notification

OBIE [Performance Metrics reporting](#), submitted by ASPSPs to the OBIE monthly

United Kingdom

TECHNICAL ARCHITECTURE

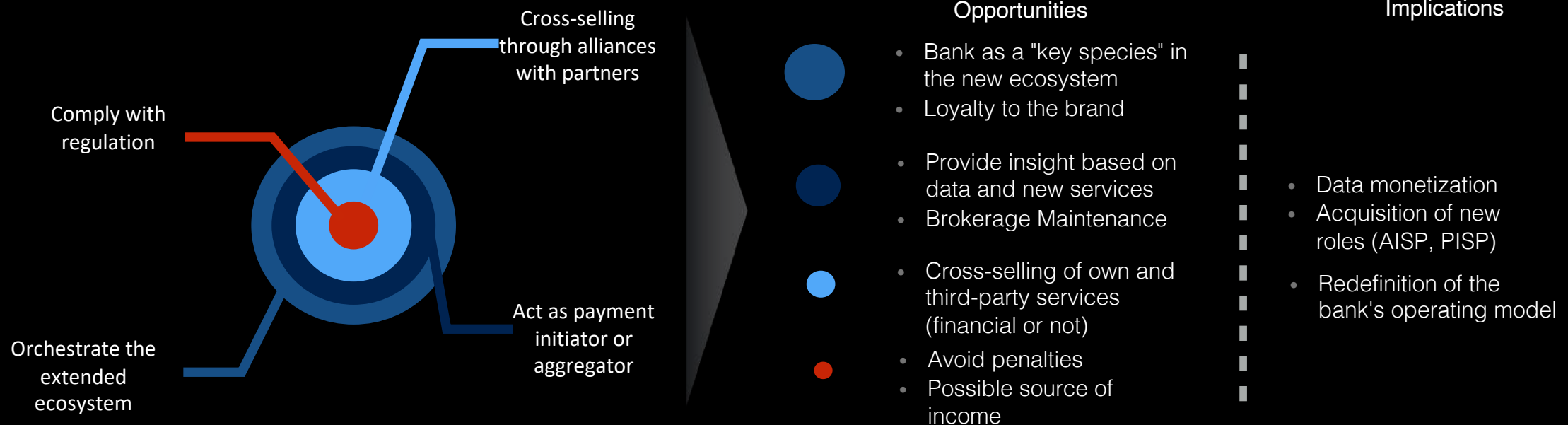
Logical Components



Spain

WHAT IS OPEN BANKING IN THE COUNTRY?

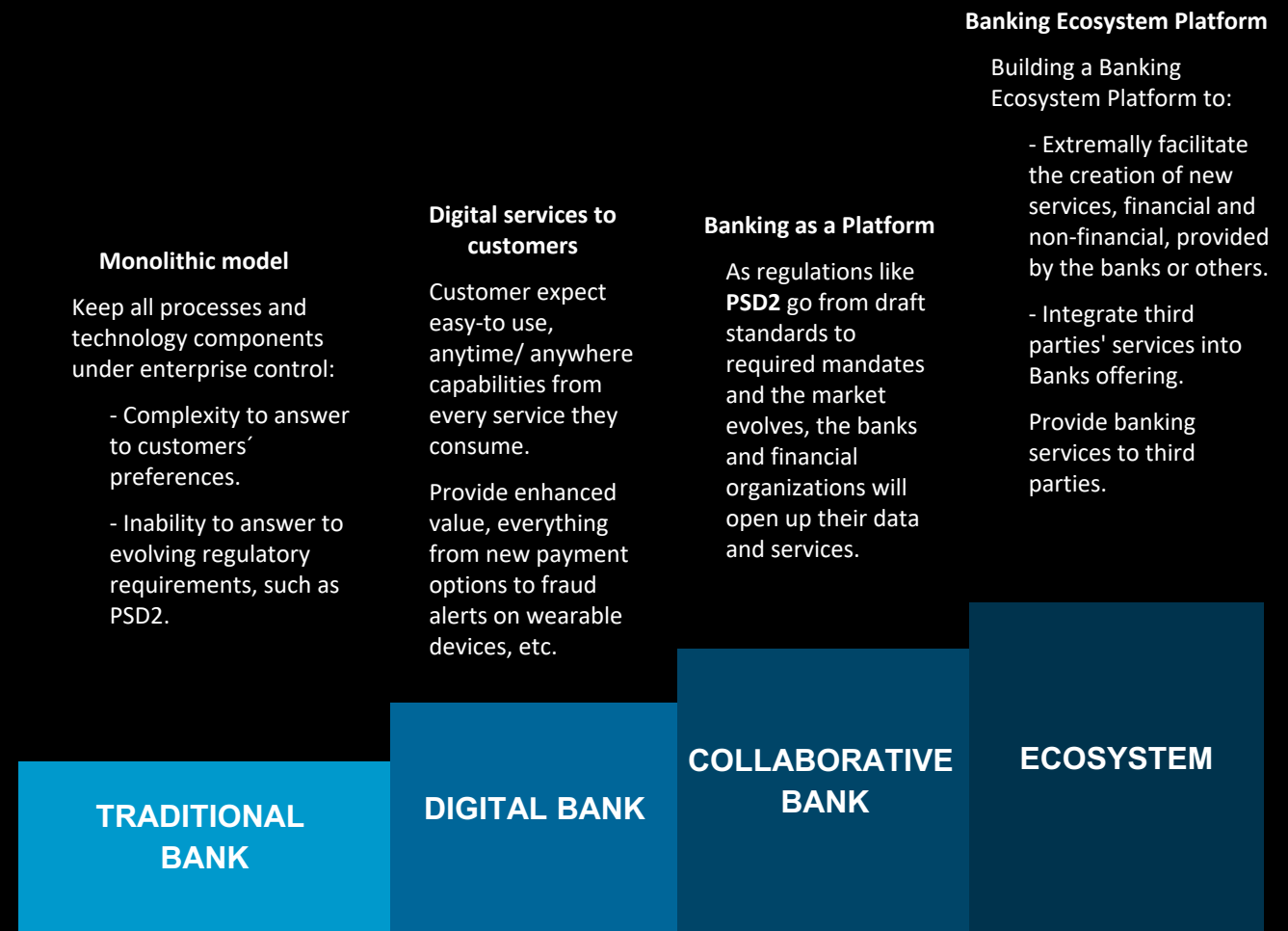
- Many times the concepts of **Open Banking** and **PSD2** are used interchangeably. Although they are intrinsically related, they are not the same. Open Banking goes beyond PSD2 and supposes the opening of bank information to enable third parties to develop applications and services consuming that information through application programming interfaces (API). We could say that PSD2 is being the driver for Open Banking.
- Open Banking through APIs means disintermediation in the value chain. Banks must decide what degree of relationship and value they want to maintain and capture.



Spain

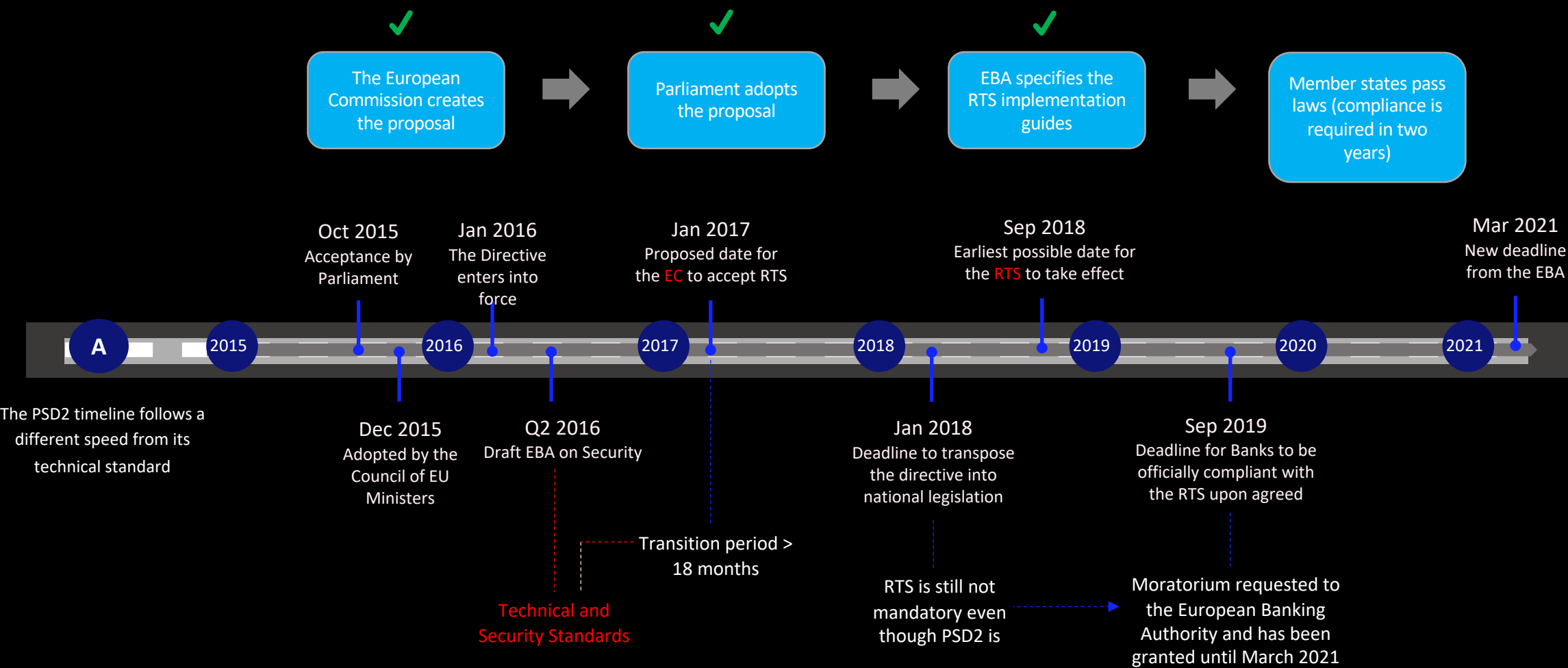
WHAT IS OPEN BANKING IN THE COUNTRY?

- Most advanced Spanish banks see the bank of the future as a "Multiservice Company", where they are going to be able to offer both financial and non-financial products and services to satisfy the everchanging customer needs. For instance, during Santander Investor Day in April 2019, Santander presented their strategy and their aim: *"To be the best open financial services platform, by acting responsibly and earning the lasting loyalty of our people, customers, shareholders and communities"*
- To do that, banks need to go beyond Open Banking and start thinking in **Open Platforms** that will enable them the creation of new business models, incorporating new partners (including of course new players like xTechs and startups) into their value chain to create Ecosystems.
- The path to the **Ecosystem**



Spain

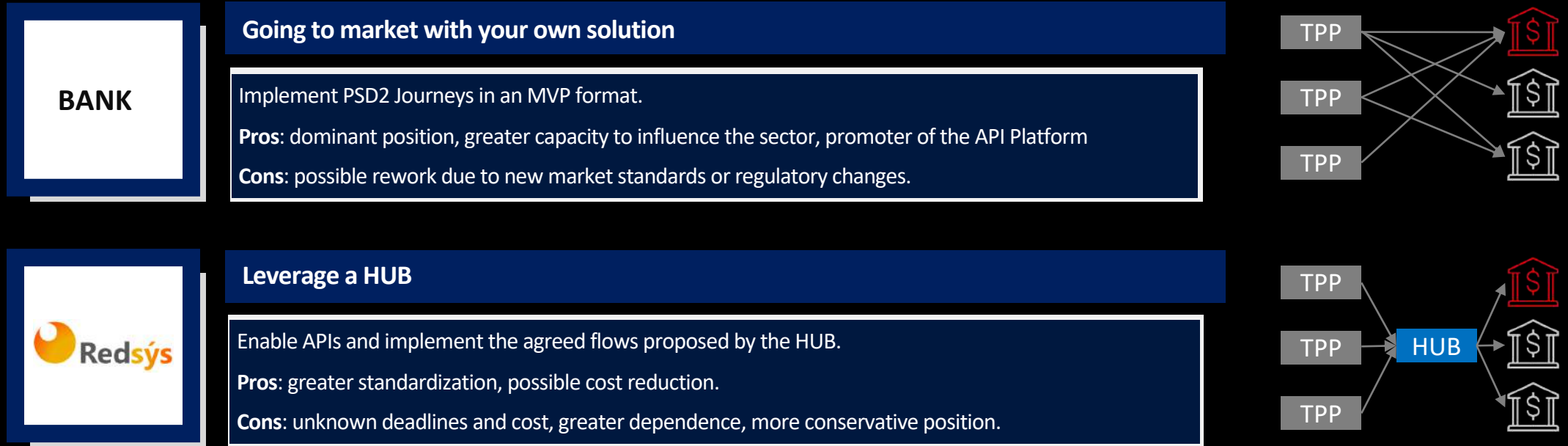
REGULATORS & REGULATIONS ISSUED



Spain

CONSUMER ADOPTIONS & USE CASES

- There are two strategic options to address PSD2:



- In Spain the majority of banks have opted for the Hub Solution, acting as the Hub Redsys payments gateway company. (e.g. <https://market.apis-i.redsys.es/psd2/xs2a/nodos/caixabank>)
- Our recommendation to our clients in this sense is to not leverage a single option. Develop a Platform that enables both options.
- Examples of Spanish main banks API portals (<https://developerhub.santander.com/>, <https://www.bbvaapimarket.com/>, https://apistore.caixabank.com/home_es.html)

Spain

CONSUMER ADOPTIONS & USE CASES

Apart from the APIs to implement PSD2, what we've seen with our customers is that the majority of the APIs they're creating (~80%) are for internal consumption (e.g. sales processes).

PSD2 use cases



1 . Banking Customers are empowered as the owners of their financial data



2. Banking Products are transparent and easy to compare



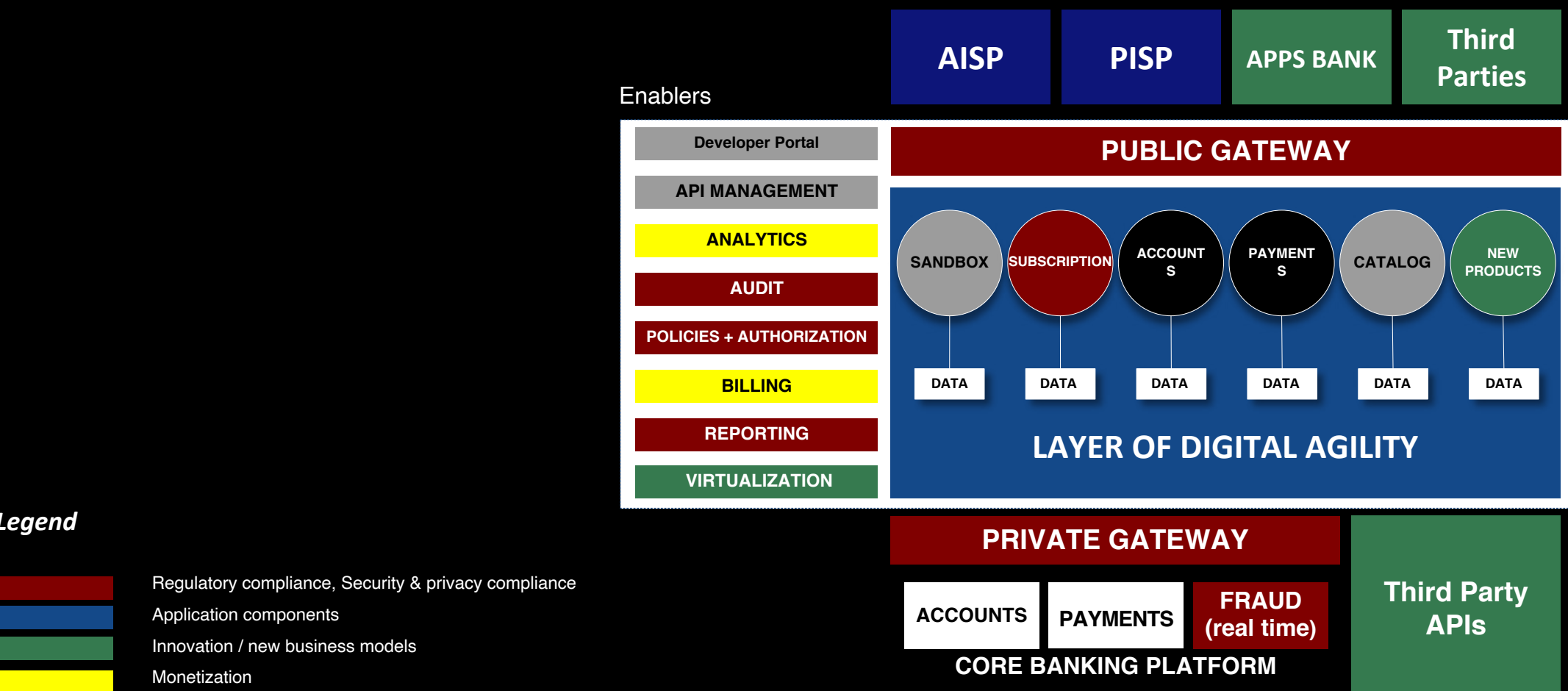
3. Multiple parties work together to create new value chains to produce better products and services



Spain

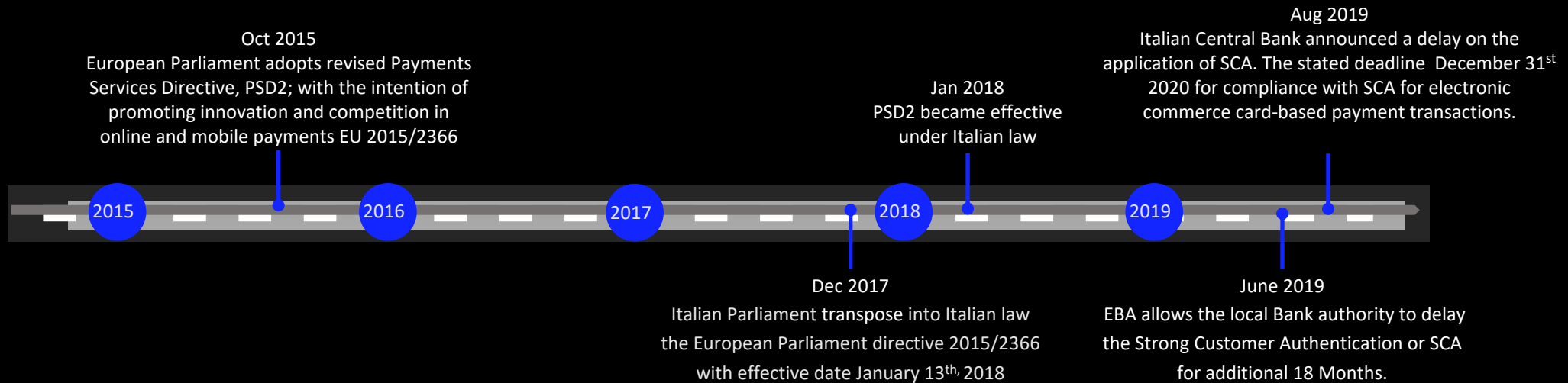
TECHNICAL STANDARDS & ARCHITECTURE

This is our architecture proposal to cover PSD2 with its own solution.



Italy

WHAT IS OPEN BANKING IN THE COUNTRY?

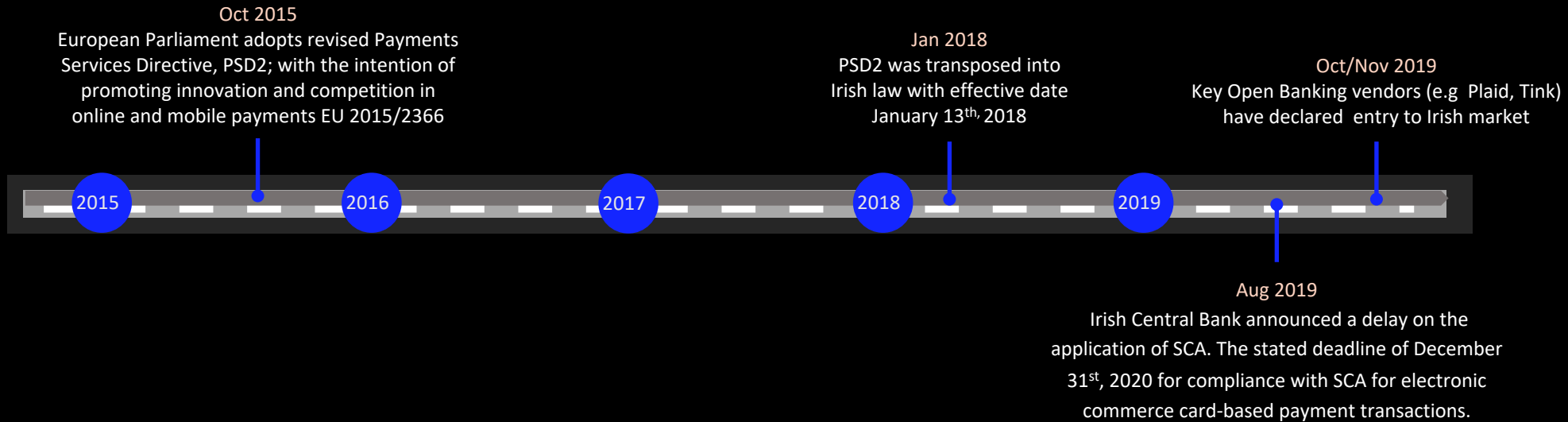


Italian Bank approach to PSD2

- The major banks adopted specific technologies to open their applications to become compliant with PSD2 regulation
- Instead of internally developing the required PSD2 interface, some medium-sized banks are using external Financial Services Providers to deliver what is required from PSD2 regulation. These companies (CBPI, SIA, Banca Sella) connect with the target bank's IT infrastructure in addition to other delivered services .
- Some small banks are using common IT service providers to manage their PSD2 compliance (BCC SI)

Ireland

WHAT IS OPEN BANKING IN THE COUNTRY?



- Initially Allied Irish Bank had APIs ready for use. All other major banks (e.g Bank of Ireland, KBC Bank) subsequently published the necessary APIs.
 - Several subsidiary banks have leveraged the infrastructure of their parent organizations (e.g. Ulster Bank)
- Currently the major banks in the Irish market appear to be taking a defensive stance. No indications yet of these organizations looking to embrace Open Banking as a means of driving cultural change and going after new opportunities
 - Just providing the minimum range of APIs to ensure compliance with their PSD2 obligations
 - Many using Legal/T&Cs related issues as an impedance to deeper engagement

France

WHAT IS OPEN BANKING IN THE COUNTRY?

- Open Banking is usually considered as the deployment of PSD2 regulation
- Open Banking is primarily seen as an opportunity for account aggregation by the banks and FinTechs
- Banks were reluctant to be compliant to PSD2 (including the SCA) by November 14th 2019
- Large number of FinTechs (account aggregators) asked for a license to become a account aggregator

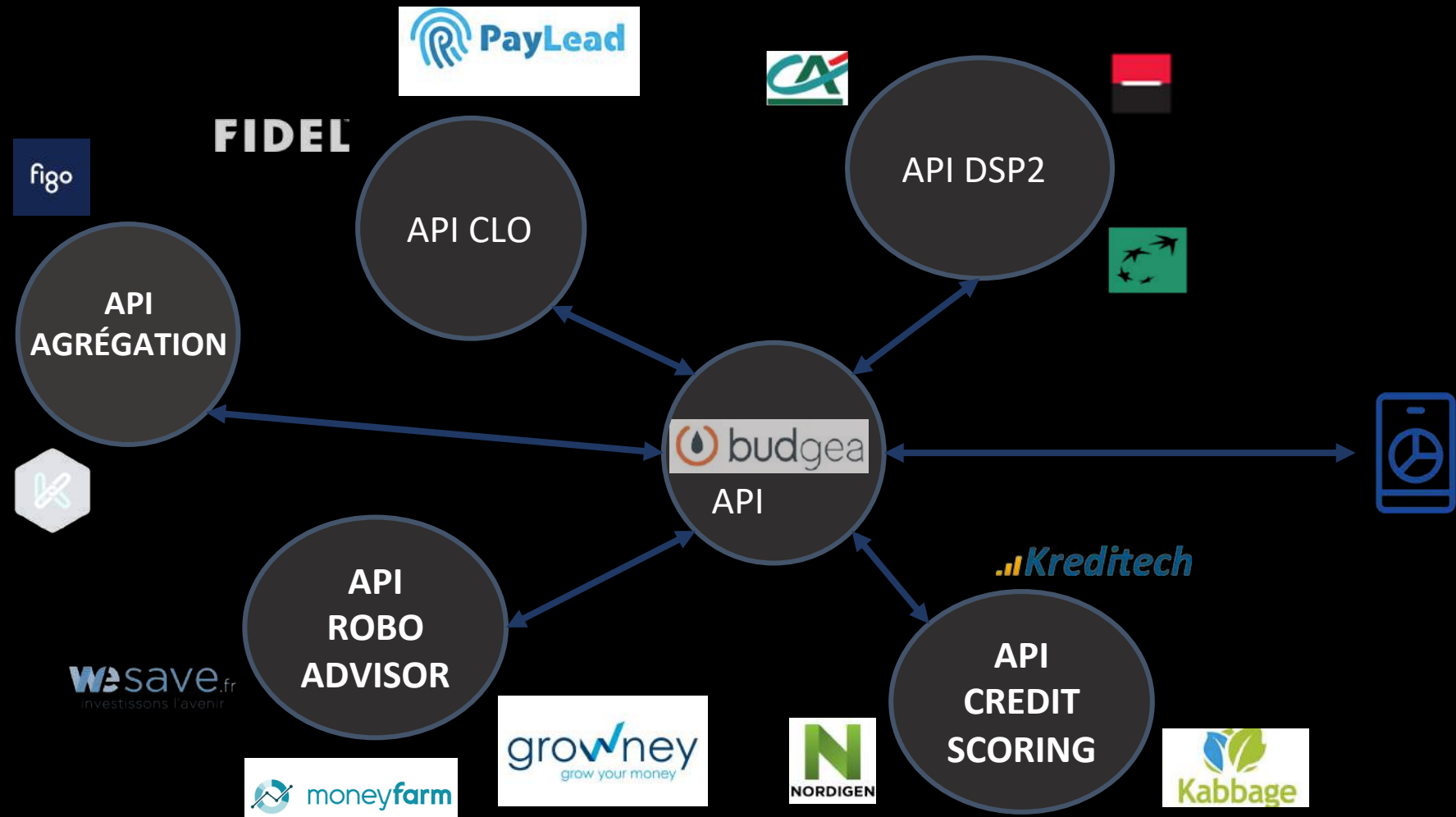
Marked view's on PSD2 – France (Sept 2019)

- 8% of banking APIs are compliant with PSD2 regulation
- 23% are partly compliant
- 4% non operational
- 50% of banking APIs are not in production
- PSD2 regulation mandated a fallback option if the required APIs were not available for third parties
- Migration phase target to have API operational by January 2020



France

USE CASES AND CONSUMER ADOPTIONS



France

USE CASES AND CONSUMER ADOPTIONS



API Budgea Bank

Account aggregation with PFM features



API Budgea Pay

Transfer initiation and beneficiary management



API Budgea Wealth

Savings account aggregation



API Budgea Hub

Financial services aggregation



API Budgea Bill

Document and bills aggregation



API Budgea DSP2

PSD2 compliant APIs

Germany, Austria, Switzerland

WHAT IS OPEN BANKING IN THE REGION?

Germany

- Mostly all financial institutions offer a PSD2-compliant, dedicated interface
- However, only a minority of banks offer API functionalities that go beyond the regulatory minimum requirements of PSD2
- More than 70 companies (based on the [BaFin register](#)) are allowed to provide PSD2 services in Germany
- In addition to PSD2, the HBCI/FinTS is already established in Germany since 1996 and provides AIS und PIS Services
- In this region, Standards created by the Berlin Group are widely adopted
- In addition to compliance-only APIs for PSD2, the following banks provide value add services:
 - Deutsche Bank
 - Fidor BANK
 - Solaris Bank
 - COMMERZBANK

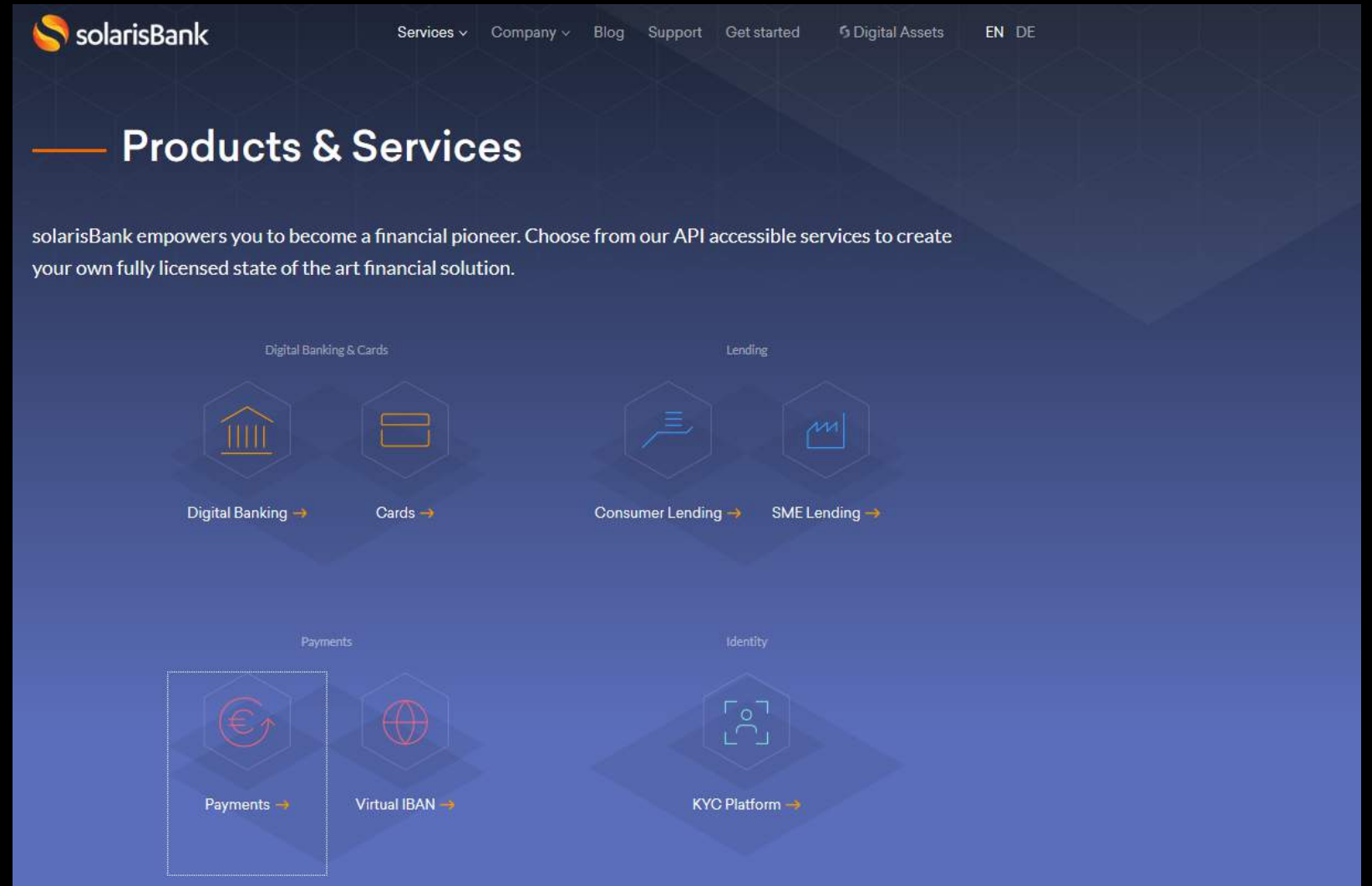
Germany, Austria, Switzerland

CONSUMER ADOPTIONS & USE CASES

Germany

Solaris Bank offering suite:

<https://www.solarisbank.com/en/services/>



Germany, Austria, Switzerland

CONSUMER ADOPTIONS & USE CASES

Germany

Deutsche Bank Developer Portal:

<https://developer.db.com/products/addresses>

Deutsche Bank
API Program

API Products

Docs

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API Products

Our APIs enable access to banking data and services of Deutsche Bank Group. They are characterized by a clear access control system for ensuring data privacy. We created API products with a defined functionality and scope that meet specific business demands. Our API products follow a modular approach and multiple APIs can easily be combined. Available API Products have access to the simulator environment and/or to live environment.

Filter

State

Live

API Product is available in live environment.

Simulation

API Product is available in simulator environment.

Upcoming

AccountInsights

Live Simulation

AccountInsights lets you see up to 12 months of transaction information from a customer's account. See what amounts are coming in and out, what currencies are being used, who the customer interacts with, and more.

View product

Age Check

Live Simulation

Age Check lets your application verify that a customer's age is above a certain age limit (18, 21 or other) and gives an instant confirmation, e.g. 'above 18 / below 18'. It is based on bank account information pre-verified by KYC checks.

View product

Income & Rent Check

Live Simulation

Individuals often need to prove they have sufficient income, for example when applying to rent an apartment. This API provides an easy and accurate way to prove one's recent income and rent payments, and describes one's financial situation well.

View product

Germany, Austria, Switzerland

WHAT IS OPEN BANKING IN THE REGION?

Austria

- Open Banking and API Banking used as synonym for PSD2
- **ERSTE Bank Group** - secure platform for digital (service) exchange in financial ecosystems.
developers.erstegroup.com
- **Bank Austria** offers [PSD2 compliant interface](#)

Switzerland

Switzerland is not subject to PSD2 and relies on market economy solutions. There are some corresponding developments in Switzerland: in terms of both the infrastructure, for example the SIX connectivity platform, and regarding the specific standardization initiatives. In addition to SIX, there are additional Common API initiatives from SFTI (Swiss Fintech Innovations), such as the Swisscom Open Banking Hub and [openbankingproject.ch](https://www.openbankingproject.ch). Core bank providers such as Avaloq and Finnova in turn build on specific marketplaces for APIs in Switzerland.

[Source](#)

Switzerland (cont.)

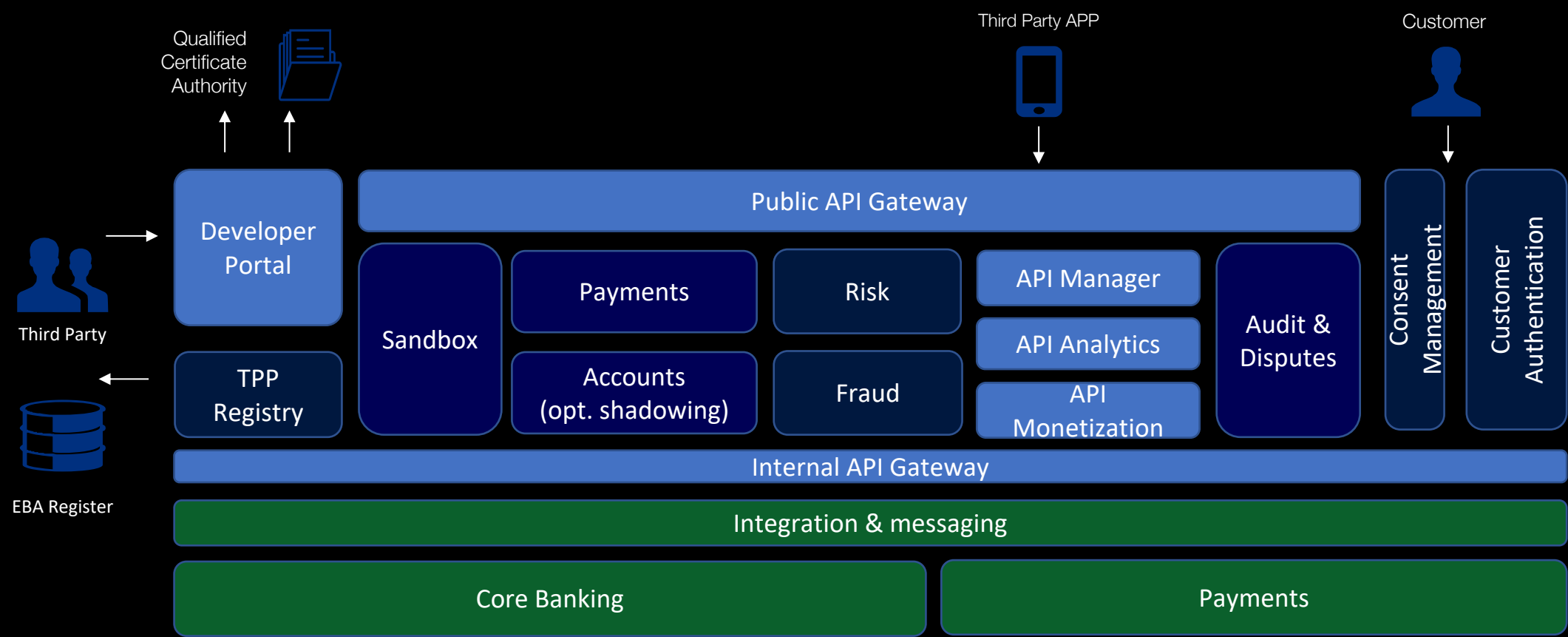
- [Connectivity Platform SIX](#)
An account information service gives TPPs access to bank account data in order to synchronize and reconcile it with companies' accounting software. A payment service enables TPPs to automatically initiate their corporate clients' payments at the corresponding bank.
- **Common-API Initiative** SFTI (Swiss Fintech Innovations) Provides vendor neutral services spec e.g. for the SIX connectivity platform:
<https://swissfintechinnovations.ch/projects/common-api/>
<https://swissfintechinnovations.ch/api-specifications/>
- **openbankingproject.ch**
Driven mostly by banking services / software providers like Avaloq and Hypo Lenzburg (the later is very active in supporting Swiss FinTechs)
<https://www.openbankingproject.ch/en/#>
<https://www.openbankingproject.ch/en/catalog/>
- [Swisscom Open Banking Hub](#) - secure platform for digital (service) exchange in financial ecosystems

Germany, Austria, Switzerland

TECHNICAL STANDARDS & ARCHITECTURE

- IBM Components configured on IBM API Connect
- Bank's exiting security infrastructure
- Existing back end services
- IBM application component with PSD2-specific logic

IBM specific PSD2 Solution Overview



Middle East

Turkey	97
United Arab Emirates	101

Turkey

WHAT IS OPEN BANKING IN THE COUNTRY?

- Even though Open Banking is not fully in place in Turkey yet, there has been an increasing trend towards API banking in recent years
- One-to-one integration of payment services with 3rd parties has been a very common practice in Turkey. Most preferred methods include
 - Banks provide credit/debit card payment services to merchants, using virtual POS integration to merchants' apps and e-commerce sites, and by integrating with digital wallets for consumers
 - Banks provides cash loan services to merchants, using one-to-one integration between their systems, both in-store and through digital channels
 - Banks provide current account payment services to merchants, using one-to-one integration between their systems, mainly through a startup called ComPay
- Other API banking includes innovation and ecosystem building. Several banks have published their public APIs (branch locator, foreign exchange rates, etc.) on their portals to be used by 3rd parties especially startups

Turkey

REGULATORS & REGULATIONS ISSUED

There is no Open Banking legislation such as PSD2 in place in Turkey yet. A recent change in the legislation - the mandate to formulate the required regulation was assigned to Central Bank of Republic of Turkey (CBRT). With this change, the regulation regarding Payment Systems and E-Money Issuance (6493) has been taken from Banking Regulation and Supervision Agency (BRSA) and assigned to CBRT.

6493 dictates how payment companies are established, how they go to market and operate. It also formulates the requirements for granting a license to (1) provide payment systems and (2) issue e-money and operate e-money services.

Although all banking activities are regulated by BRSA in Turkey, with this change, all FinTech activities (payment, e-money, account aggregation) will be regulated by CBRT.

CBRT is expected to formulate a follow-up on 6493 to draw the details of Open Banking in the next 1-2 years.

PSD2 will be the main basis for the expected follow-up as Turkey is economically and financially very interconnected with EU and financial services regulations have been in parallel with EU up to now.

Links to regulators & regulations in Turkey

- [Details on the mission, organization and strategies of CBRT](#)
- [Details on the mission, organization and strategies of BRSA](#)
- [6493 - the initial legislation regarding payment systems, e-money companies in Turkey](#)
- [Association of the Payment Services Companies in Turkey](#)

Turkey

USE CASES & CONSUMER ADOPTIONS

If Open Banking is introduced in Turkey, the following developments are expected

- All banks will publish their account inquiry, payments, and transfer APIs to the public
- API-based payment methods on the digital platforms will grow (i.e. Cash Loan for shopping, wire transfer for shopping)
- Aggregator apps will be introduced (TekCep Commercial Account Aggregator Service developed by Softtech and deployed within İşbank mobile app in September 2019 is the first example)
- Comparison apps will be introduced (there are websites for comparison but there is no integration to the banks' systems so they are solely informational)
- Personal financial management apps will be introduced (there are limited examples, adoption has been slow up to now)

Multiple account holding is a common behavior in Turkey - positive dynamics for account aggregation apps

Credit card ownership/usage is very high in Turkey - 68.6 million active cards as of November 2019 (Turkey population: 80.8 million, Turkey banked population: 55.6 million)

Turkey has a young population. M-commerce growth is high. Card penetration is high. The bottomline is there is great potential for improving customer experience in payments domain with Open Banking applications. Source: <https://www.jpmorgan.com/merchant-services/insights/reports/turkey>

TURKEY: At a glance

Population ⁴	80.8 million
Average age ⁵	32.5 years
Gross domestic product ⁶	\$851.5 billion
E-commerce market value ⁷	\$11.6 billion
Mobile commerce market size ⁸	\$3.5 billion
Mobile commerce as a percentage of e-commerce market size ⁹	30%
Internet penetration ¹⁰	64.7%
Smartphone penetration ¹¹	49.8%
Bank account penetration ¹²	69%
Card penetration per capita ¹³	2.4

Turkey

TECHNICAL STANDARDS & ARCHITECTURE

One of the biggest problems in Turkey for current Open Banking ecosystem is the lack of technical standards. Each bank has its own standards, which results in challenging and time-consuming integration cycles for FinTechs

Service contract terms, lack of support documents, lack of documents for SDKs, lead to problems in development efforts of FinTechs.

No reporting requirements are defined yet – will be defined in CBRT's new legislation expected in the next 1-2 year.

United Arab Emirates

WHAT IS OPEN BANKING IN THE COUNTRY?

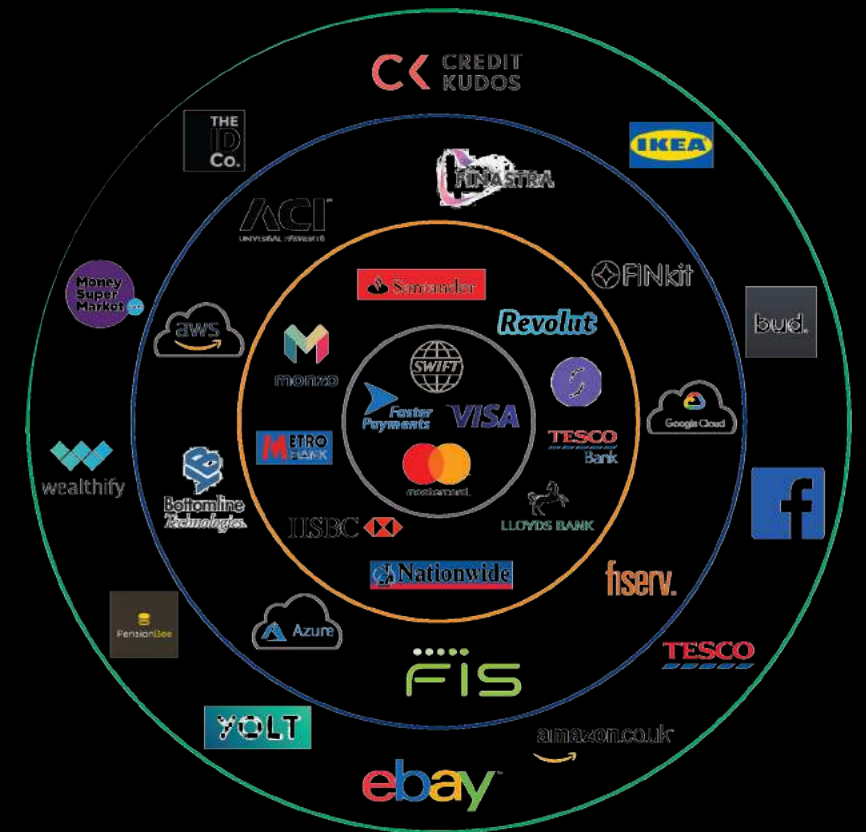
UAE banks are in a discovery phase for Open Banking, current initiatives lack standardization

Current status

- Banks in the UAE, currently, are in a discovery phase for Open Banking
- No bank in the UAE has implemented Open Banking APIs in production.
- Different consultants have advised, particularly the large banks, to 'prepare' for Open banking. Reasons for this include
 - New business models will become a reality very soon
 - Being left behind due to a lack of readiness at that time
 - Regulation from Central Bank of UAE

Platform Banking

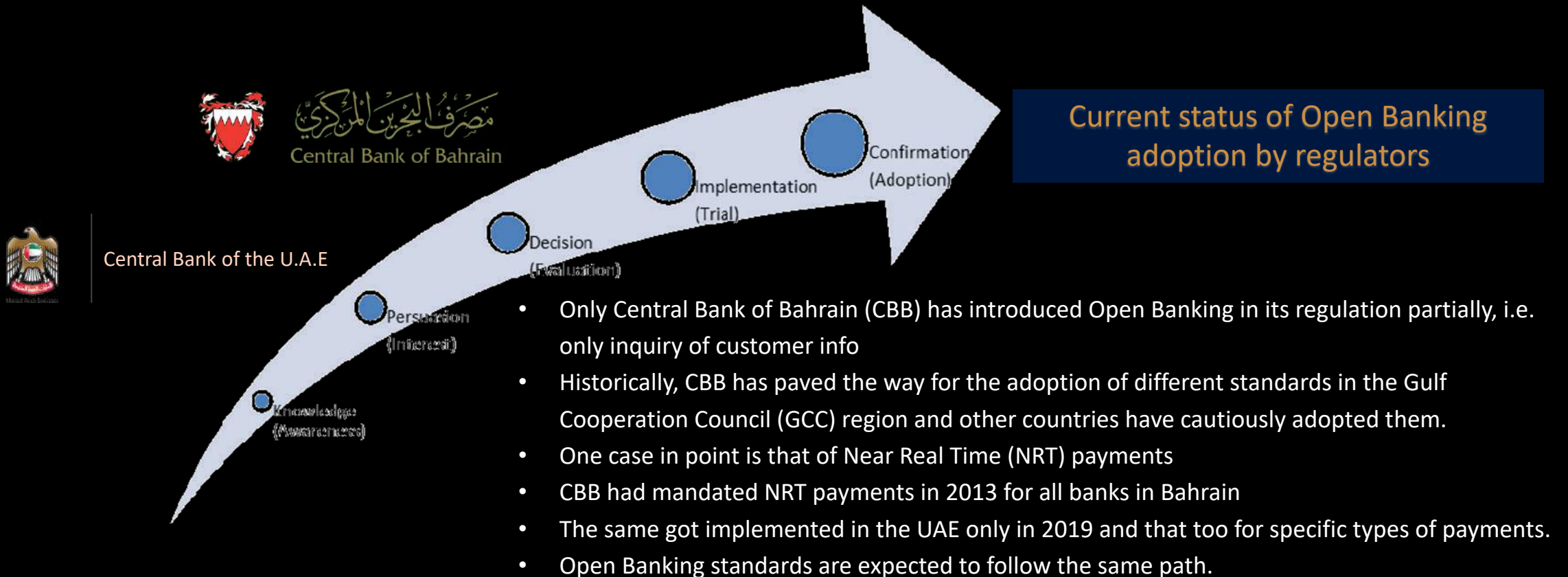
- As part of their digital transformation, banks have been attempting to engage customers via digital experience and platform banking
- Penetration of FinTechs in the UAE financial services market remains low.
- Partnerships between banks and other service providers are common to boost customer loyalty
 - Partner with businesses (e.g. airlines) to share loyalty programs Points customers earn by transacting with the bank can be redeemed at these stores
 - Integration not based on standard



United Arab Emirates

REGULATORS & REGULATIONS ISSUED

Central Bank of the UAE has not issued any regulations regarding Open Banking



United Arab Emirates

USE CASES & CONSUMER ADOPTIONS

Banks in UAE have implemented some Open Banking use cases. The use cases below are not implemented based on a specific set of standards.

- Utility Bill payments
- School fee payments
- Integration with vehicle dealers for auto-loan quotes and applications
- Loyalty programs
- Cross border remittance (Banks act as source of funds) via exchange houses
- Direct Debit authorization and management
- CB UAE integration
 - Local Near real time (NRT) payments
 - Cross border NRT payments (POC)
- Offshore banking – Integrate with offshore banks
- Payment of government services
- Digital KYC
- Corporate Banking
 - Account Management
 - Supply Chain Finance
 - Wealth Management
 - Corporate employee accounts management
 - Corporate cards management
 - Reporting
- Investments
 - Equities exchange integration (Abu Dhabi Exchange – ADX, Dubai Financial Markets – DFM, others)
 - Integration with investment brokerage houses

United Arab Emirates

USE CASES & CONSUMER ADOPTIONS

Banks in UAE are considering to implement several Open Banking use cases. IBM is engaging with several banking clients in the UAE to discuss and implement several of the following Open Banking use cases

- New business models. Partner with different organizations to provide customers value added services
 - Loyalty programs
 - Retail Industry
 - Automotive
 - Ecommerce providers
- Fintech integration
 - Account aggregation
 - Fuel payments
 - Cross border remittance
- Cross border remittance
- Direct Debit authorization and management
- Government services
- Digital KYC for retail, SME and corporate customers
- New Corporate Banking use cases
- New investment possibilities and products

United Arab Emirates

TECHNICAL STANDARDS & REPORTING REQUIREMENTS

- Standards are driven by banking consortiums for new business models and profitability
- Onshore regulator (CBUAE) and offshore regulators (e.g. Abu Dhabi Global Markets) are working on a consolidated set of standards for Open Banking in the country

Standards

- PSD2 is the leading Open Banking standard that UAE banks aim to implement in 2020
- For the banking industry and government, two use cases are most important:
 - eKYC
 - Payments

Technology

- Banks have implemented external API gateways
- IBM API Connect remains the leading choice
- No bank has implemented Open Banking APIs

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Çağlar Okat

Executive Champion



Che An

VP & Partner, Core Banking
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