



# OpenBanking APAC –

New world collaboration for payments



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## "Open Banking APAC - New world collaboration for payments"

### *Recommendation from Regional Survey*

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# EXECUTIVE SUMMARY

As we move into the 2020s, Open Banking may well be the innovation that marks and defines the banking and financial services of a new era.

Over the past few years, there have been efforts to introduce Open Banking, ranging from the issuance of APIs by individual banks, to the publication of industry-wide APIs standards, to regulatory mandates.

Open Banking, properly implemented, will modernise the payments ecosystem and deliver great benefits to consumers. It will foster innovation and competition across the sector, and lead to more seamless and frictionless user experiences. Ultimately, it holds the promise of providing consumers with greater control over their data and greater choice in the products and services they use.

While much of the attention on Open Banking has been on implementations such as those in the UK and the European Union, the Asia-Pacific region has also seen significant innovations and developments in Open Banking, be it the India Stack with its game-changing Unified Payments Interface (UPI) or Australia's regulatory initiatives to roll-out a multi-sector Consumer Data Right.

This report focuses on the Asia-Pacific region and highlights findings from a new survey of industry participants and observers from Asia-Pacific. It also provides an overview of developments in the region, and some preliminary observations and recommendations for policymakers and industry participants.

The main message is that we are still in the early days of Open Banking development, both globally and within the Asia-Pacific. It holds great promise and significant potential, and regulators can play an important role in realizing that potential.

It is also increasingly clear that there is no "one-size-fits-all" approach to introducing Open Banking – which presents an opportunity to regulators, industry and other stakeholders to collaborate in order to tailor approaches that would be the most appropriate to the local context, and that would likely involve continued diversity, experimentation and adaptation of frameworks and approaches.

To fulfill the promise of Open Banking in the years to come, this process of experimentation and adaptation is welcomed, necessary and beneficial, and success in the future depends on ensuring interoperability, and putting innovation at the front and centre of any future work.

# INTRODUCTION

## What is Open Banking?

In a recent report by the Basel Committee for Banking Supervision at the Bank for International Settlements (BIS), Open Banking is defined as follows:

*“(T)he sharing and leveraging of customer-permissioned data by banks with third party developers and firms to build applications and services, including for example, those that provide real-time payments, greater financial transparency options for account holders, marketing and cross-selling opportunities.”*

The definition and practice of Open Banking has been evolving. In the early 2010s, it was used to refer to the specific use of APIs by banks and third-party developers, as a more secure alternative to screen scraping. More recently, there has been emerging consensus that Open Banking goes beyond specific data sharing techniques, such as APIs, reverse engineering, or screen scraping. When primarily defined as techniques instead of its values or goals, Open Banking can be mistaken as “a solution looking for a problem.”

Open Banking is an initiative that “opens up banks” by enabling customers to have greater control and ownership over their personal information. With consumers’ consent, data is shared between banks, financial-service providers and financial technology companies, commonly referred to as Fintechs. The data is then aggregated, automated, and analysed in new applications. The communication of information between organizations can take place via APIs, screen scraping, or reverse engineering. The drive for transparency and efficiency is leading a revolution in the financial services ecosystem, where banks are now sharing data with third parties. Companies such as Fintechs and Payment Technology Companies (Paytechs) are moving into this new market to provide innovative services to customers. This yields several additional benefits to consumers including greater choice as well as gains from increased innovation due to enhanced competition in the ecosystem.

While the implementation of Open Banking varies in scope, approach, and stage of development, its development has gained momentum around the world, due to fast widespread technology adoption, digitisation of financial services, and advancements in data collection, storage, and analytics capabilities.

## What are the Benefits of Open Banking?

In many ways, the benefits of Open Banking are derived from the new pipes it will create to connect previously disparate entities and systems. Consumers and businesses can enjoy new and improved experiences as a result of Open Banking. Through control over their data, customers can enjoy enhanced and tailored experiences, faster and more efficient payments, and consolidated view of financial accounts with different financial entities in one single dashboard. Open Banking presents an opportunity for Fintechs to work with incumbent data organisations to create new data use cases. For instance, better credit scoring of underserved populations or faster and more convenient Know-Your-Customer (KYC) processes could be instrumented. It is important to note that the benefits of Open Banking include empowering consumers to control their own data, providing consumers with

choice, and creating new opportunities for competition, collaboration, and innovation. Open Banking also brings benefits to consumers in the digital economy – for instance, banks are directly brought into the checkout experience in e-commerce – thereby providing more options for consumers in the way that they want to pay for their online transactions.

Another important benefit of Open Banking could be enhancements in Anti-Money Laundering (AML) activities, given that more efficient and effective information sharing between institutions will result from greater interoperability in sharing customers' information, and there are more opportunities for identification anomalies to be exposed if data is shared between financial institutions (Bank and non-Bank) regarding the same customer.

## What are the risks of Open Banking?

Open Banking is multi-disciplinary by definition and in practice, including and necessitating considerations of data privacy, cyber security, customer consent, customer liability and redress, governance of third-party and fourth-party relationships, API risk management and many more.

Given its multi-disciplinary nature, many parties are impacted by Open Banking. The set of specific opportunities and risks for each impacted party varies, but they all point towards the need to build a robust infrastructure and ecosystem for the principal purposes of interoperability and innovation. The following table lists some of the potential risks and next steps for different parties in the ecosystem:

Impacted Party	Potential risks	Potential next steps
<b>Consumer</b>	<ul style="list-style-type: none"> <li>■ Fraudulent use of consumers data</li> <li>■ Lack of consumer awareness and knowledge of the benefits of Open Banking</li> <li>■ Data breaches leading to losses</li> <li>■ Lack of access to Open Banking opportunities</li> </ul>	<ul style="list-style-type: none"> <li>■ Better security</li> <li>■ Education and awareness of 'how to'</li> <li>■ Better data protection, more transparency and consent – 85% of customers willing to share data for better experience</li> <li>■ Inclusion, where more people are given access to banking</li> </ul>
<b>Bank (including Neo/Virtual Banks)</b>	<ul style="list-style-type: none"> <li>■ Implementation of new front-end and back-end IT systems</li> <li>■ Fraud risk</li> <li>■ Data Integrity / Protection</li> <li>■ Competition</li> <li>■ Disruption from innovation</li> <li>■ Compliance with regulatory requirements</li> </ul>	<ul style="list-style-type: none"> <li>■ Change management / Vendor partnerships</li> <li>■ AI to process the volumes of data quickly</li> <li>■ Efficient IT processing, with lower touch</li> <li>■ Innovation</li> <li>■ Awareness/responsiveness of innovation</li> <li>■ Upgrade technology to be proactive</li> </ul>
<b>Technology Vendors/ Service Providers</b>	<ul style="list-style-type: none"> <li>■ Opportunity to offer new services</li> <li>■ Development of business opportunities to banks and others</li> <li>■ Competition with incumbents</li> <li>■ Connectivity to infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>■ Identify areas of greatest issues</li> <li>■ Building business case for investment in new developments e.g. incumbents incubating startups</li> <li>■ Competition strategies</li> <li>■ Being open to connection with standardisation</li> </ul>
<b>Regulators and policymakers</b>	<ul style="list-style-type: none"> <li>■ Knowledge / Education</li> <li>■ Sovereignty over regulation</li> <li>■ Consumer Protection</li> <li>■ Data Privacy</li> <li>■ Fairness</li> <li>■ Enforcement</li> </ul>	<ul style="list-style-type: none"> <li>■ Industry to explain and educate regulatory/policymakers</li> <li>■ Stakeholder engagement</li> <li>■ Provide policy guidance for Data management</li> <li>■ Legislation protection</li> <li>■ Standard adoption</li> <li>■ Communication and review to ensure compliance</li> </ul>



## So what is happening in Asia Pacific Region?

The Asia-Pacific region has been highly active when it comes the development of Open Banking. It is also the most populous, fastest growing, and most economically vibrant region. Significant innovation has been driven by socioeconomic developments, including urbanisation, a growing middle-class, and rapid uptake on new consumer technologies, such as smartphones. As a diverse and dynamic region, Asia-Pacific has the potential to lead innovations in Open Banking

# METHODOLOGY

This report is part of the Emerging Payment Association (EPA) Asia's research efforts on the current state of Open Banking payments in the APAC region. The report consists of review of regional developments and a survey. In addition, this report is accompanied by a service and supplier directory accessible from the [www.emergingpaymentsasia.org](http://www.emergingpaymentsasia.org) website – this is part of an initiative to share information with readers of this report who might be seeking information and guidance with regards to their Open Banking project.

The survey was conducted from September to December of 2019. The main target was a selected audience of enterprises and experts based in, or connected to Asia-Pacific, who were interested or involved in Open Banking. This has included banks, payments experts, central banks, and paytech firms. Over 100 industry experts and professionals from Australia, India, Singapore, New Zealand, Thailand, and Hong Kong shared their insights and perspectives in response to the survey.

The survey gathered data on how Open Banking is understood and perceived, how Open Banking is rolling out across Asia-Pacific, and what factors are under consideration. The survey included sections on general understanding, risks, approaches (industry- versus regulator-driven), Open Banking standards, and the potential impact of Open Banking on payments. In addition to surveys, literature review and interviews were conducted to analyse the landscape of the Asia-Pacific region, which included the status of API adoption, regulatory guidelines, sandboxes and their role in facilitating connectivity between fintechs and banks.

The information and survey responses gathered by the project form the basis for EPA ASIA's presentation at the Asia-Pacific Financial Forum in February 2020. The results of the project will be presented to the Asia-Pacific Economic Cooperation (APEC) Business Advisory Committee (ABAC), and will be included on the regulatory agenda of the APEC finance ministers.

# GLOBALVIEW

## Experiences from Other Regions

This section will provide a broad overview of different approaches to Open Banking, and the experiences of Open Banking in the United Kingdom, Europe, the United States and Canada, which could serve as reference points for developments in the Asia-Pacific region.

### 4.1 Open Banking as Defined by the BIS

The Basel Committee for Banking Supervision at the Bank for International Settlements (BIS) has recently defined Open Banking as follows:

*“(T)he sharing and leveraging of customer-permissioned data by banks with third party developers and firms to build applications and services, including for example those that provide real-time payments, greater financial transparency options for account holders, marketing and cross-selling opportunities.”*

The BIS Report on Open Banking also categorised the approaches taken by different jurisdictions in terms of implementing Open Banking. These are:

Approach	Countries/Regions
<p><b><u>Prescriptive approach</u></b> where banks are required to share customer-permissioned data and where third parties that want to access such data are required to register with particular regulatory or supervisory authorities to do so.</p>	Australia, UK, European Union
<p><b><u>Facilitative approach</u></b> where an industry standard-setter or government agency issues guidance and recommended standards and / or releases open API standards and technical specifications. Banks and third parties are not required to adopt but may do so if they choose.</p>	Singapore, Hong Kong, Japan

Approach	Countries/Regions
<p><b><u>Market-driven approach</u></b>            where there are no explicit industry-wide rules or guidance that require or prohibit the sharing of customer-permissioned data by banks with third parties. Banks may choose to release their own APIs</p>	<p>US</p>

Other researchers have also developed a similar classification system, which describes the development of Open Banking as Mandatory, Supportive and Neutral.

Different governments have taken different approaches to Open Banking: prescriptive (EU PSD2), facilitative (Hong Kong), and market-driven (US), with variations in scope and requirements. While evaluating the merits and relevance of frameworks, it is important to consider how consumer demand and market developments would fit alongside government prescriptions and/or guidelines. Proponents of a Prescriptive Approach note that either capacity limitations or the dominant role of incumbents as the basis of regulatory intervention, and highlight the benefits of having clear, consistent, and standardised requirements and expectations. On the other hand, proponents of a Market-Driven Approach express concerns about heavy handed regulation driving out sustainable innovation and competition. No approach has emerged as the "one-size-fits-all" approach. In fact, Open Banking presents an opportunity to regulators, industry and other stakeholders to collaborate in order to tailor approaches that would be the most appropriate to the local context, and that would likely involve continued diversity, experimentation and adaptation.

We see significant diversity across the Asia-Pacific, with Singapore and Korea having more market-driven approaches, while India and Australia have seen governments and central banks playing a highly active role in defining the Open Banking ecosystem.

## Market-Driven

## Prescriptive

Singapore	Korea	Hong Kong	Thailand	India	Australia
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## 4.2. European and UK Experience: Prescriptive Approach

The European Union has been a leader of the Prescriptive Approach to Open Banking. The genesis of Open Banking was the second Payment Services Directive (PSD2), proposed in 2013. Adopted in 2016, the Directive was to be transposed into national law in member countries by January 2018. A key component of the Directive is the ability for authorised third parties to access account information and to initiate payments, with customer consent. The PSD2 provides two options for banks to provide this access: either through their existing customer interfaces, or through dedicated interfaces (APIs). While technical standards further detailing the criteria that the interfaces must meet came into effect in September 2019, the actual API standards were left to the industry to develop. Several regional standardisation efforts emerged to fill that gap, but the current fragmented landscape in API standards make wide-spread adoption a challenge. A single, well-define standard would help lower barriers for new entrants to the market. It must however have to be sufficiently flexible to allow for appropriate tailoring to the respective banks and TPPs that want to make use of it.

At the same time, this lack of standardisation has also left room for innovation and competition, with a number of innovative TPPs specialising in bank connectivity to fill that gap. But it is still too early to truly assess the impact of PSD2 on Open Banking in Europe, especially given the other ongoing initiatives to further drive its development, such as the European Central Bank's proposed API Access Scheme.

The UK has been one jurisdiction that has gone beyond the PSD2 obligations, and it has largely been the result of regulatory initiation.

In 2016, the UK Competition and Markets Authority (CMA) published its report on UK retail banking and proposed a number of initiatives including Open Banking. In the implementation of Open Banking in the UK, the nine largest banks were obliged to enable their personal and small and medium-sized business customers to share their account information securely with other third-party providers.

The Open Banking Implementation Entity (OBIE) was established to deliver Open Banking by 2018. Governed by the CMA and funded by industry participants, the OBIE issues the API specifications, issues security and messaging standards, and provides overall support for the UK Open Banking ecosystem.

While uptake has been modest since its launch in January 2018, industry participants see Open Banking as a work-in-progress with significant opportunity for banks and third-party Fintech and Regtechs to collaborate and innovate.

While some commentators have been critical of the slow take-up of Open Banking by UK consumers, the UK Open Banking Implementation Entity reported in January 2020 that it had reached the milestone of 1 million customers taking advantage of Open Banking to access their data. This steady growth suggests a coordinated approach with interoperable standards has merit, though Open Banking's impact may take longer to shape up and take root.

## 4.3. The US and Canadian Experience: Market-Led Approach

While regulators have driven a prescriptive approach in Europe and the UK, the United States has seen a more Market-Led Approach. According to a report by Ernst and Young, regulators in the US are taking more of a “wait and see” stance. Banks and payment providers have largely chosen to issue their own APIs, and are partnering with Fintechs and Regtechs to offer new apps. In recent years, an industry-led consortium of players named the Financial Data Exchange (FDX) has emerged to set standards for financial data sharing, with participation from the major banks as well as non-bank financial institutions (including Fintechs) in the US.

Canada, similar to a number of other jurisdictions, is assessing its options. The Department of Finance just released the findings from the first phase of the review by the Advisory Committee on Open Banking, and announced that the committee will undertake a second phase of work to continue to examine the merits of Open Banking, with a particular focus on data security in financial services. There has also been a Senate Committee report and a commitment to establish Consumer Data Right in Canada, not too dissimilar to the right that underpins Open Banking in Australia, though its scope and application remains to be seen.

While there has been some innovation in the North American market, the lack of a strong regulatory or centralised industry push, combined with differences between younger and older customers in terms of preferences for new products and services, altogether suggest the reasons behind a more fragmented and less interoperable approach thus far – which could make it difficult for new entrants to fully take advantage of the benefits.

# OPEN BANKING IN ASIA-PACIFIC

Asia-Pacific consists of some 51 markets. Asia is home to 60% of the world's population. Despite significant growth in banked population, according to the World Bank's Findex, a third of the world's 1.7 billion unbanked population live in four Asian countries – China, India, Pakistan and Indonesia. The Asia-Pacific community has a diverse range of progress in payments systems across region: India and Thailand (and more recently Australia) have adopted a Prescriptive Approach. Other markets such as Singapore, Japan, South Korea and Hong Kong have all adopted a Facilitative Approach, while China is taking a Market-Based Approach. A Prescriptive Approach is often adopted when the regulator feels the need to lead the change process.

Compared with PSD2 in Europe, the experience in the Asia-Pacific (APAC) region has been more diverse, and countries vary greatly in terms of stages and approaches to Open Banking. While understanding and impressions of Open Banking vary within the sample of our survey respondents, a majority (75%) of survey respondents thought that Open Banking brings value to the payments industry. 56% thought that real time banking would help with Open Banking, because payment speed could provide a better user experience. Over half of respondents think of Open Banking as a shift in control of data to consumers (52%), greater data accessibility (54%), and innovation in financial services and products (57%).

## Does Open Banking bring value to the payments industry?



What is your understanding/ impression of Open Banking? (multiple options possible)	Count	Percentage of total (total = n = 105)
APIs	63	60% 
Stimulate innovation in financial services and products	60	57% 
Greater data accessibility	57	54% 
Open standards for data sharing	56	53% 
Shift in control of data to consumers	55	52% 
Better payments access	36	34% 
Integrated Transactions	30	29% 

Amongst 51 markets in APAC, there was no evidence of Open Banking in 27 markets. The remaining 24 countries have adopted different approaches. Their stage of development can be understood and analysed in terms of (i) Open API adoption, (ii) regulatory guidelines, (iii) Fintech ecosystem, and (iv) adoption of new technologies.

Presence of Open Banking	Absence of Open Banking
Australia, Bahrain, China, Hong Kong, India, Indonesia, Iran, Israel, Japan, Malaysia, New Zealand, Pakistan, Philippines, Qatar, Russia, Singapore, South Korea, Sri Lanka, Chinese Taipei, Thailand, Turkey, United Arab Emirates, Vietnam.	Afghanistan, Armenia, Azerbaijan, Bangladesh, Butan, Cambodia there, East Timor (Timor Leste), Georgia, Iraq, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Laos, Lebanon, Macao, Maldives, Mongolia, Myanmar (Burma), Nepal, Oman, Saudi Arabia, State of Palestine, Tajikistan, Turkmenistan, Uzbekistan, Yemen.

## Open API adoption :

Open APIs play an important role in Open Banking as they facilitate connections between banks and third-party providers (IDC, 2019). New applications and services are thus dependent on the level of open API adoption within a country. The prevalence of open APIs (as opposed to private APIs) could signal the level of interoperability.

## Regulatory Guidelines :

It is hypothesized that the overall collaborative innovations within markets that have taken a more Facilitative or Market-Based Approach show slower progress in comparison to markets with a more active regulatory presence. The presence of a regulatory framework, and regulatory guidance on API and data protection standards may be particularly conducive to the overall progress of Open Banking (IDC, 2019).

## Fintech Ecosystem :

The Fintech industry has grown and the ecosystem involves a wide range of stakeholders, including consumers, financial institutions, and regulators. A healthy Fintech ecosystem benefits all stakeholders by lowering costs and improving the quality of the financial offer (EY, 2018). Open Banking facilitates the growth of Fintechs by offering a competitive and innovative environment through the transfers of consumer data (Dow, 2019).

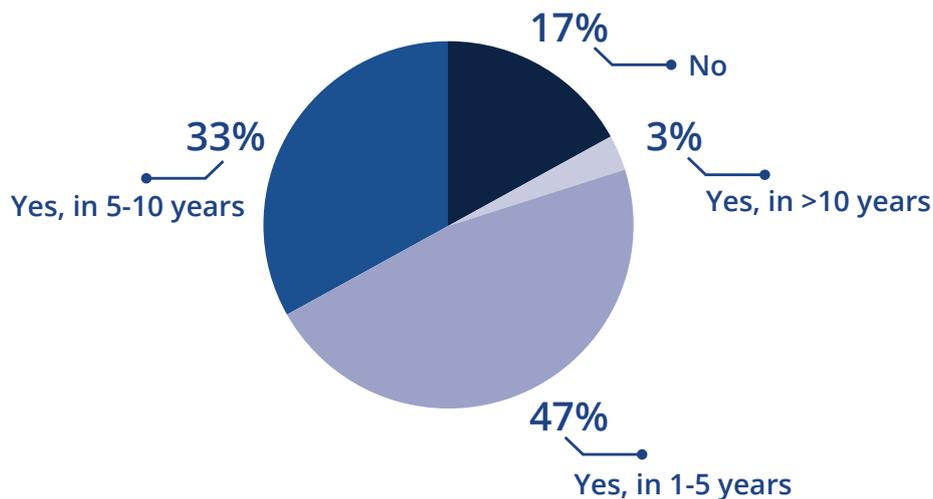
## Adoption of new technologies :

Open Banking is a symbiosis between technological innovations and the banking value chain (Marous, 2018). The adoption rate of new technologies by financial entities is relevant for gauging the status of Open Banking adoption (Deloitte, 2015). Countries supporting financial innovations tend to have a competitive advantage and are likely the front-runners in Open Banking.

<b>Good Progress</b>	Singapore, Hong Kong, Australia.
<b>Moderate Progress</b>	India, Malaysia, Thailand, Japan, Chinese Taipei, New Zealand, Bahrain, United Arab Emirates
<b>Low Progress</b>	China, Indonesia, Philippines, Iran, Israel, Pakistan, Russia, Sri Lanka, Turkey.
<b>Presence of Awareness</b>	South Korea, Qatar, Vietnam.

A majority (80%) of survey respondents answered that Open Banking is a project that is underway in their country, and 76% of survey respondents believe that access to credit (as part of the lending process) should be considered with the scope of Open Banking. Overall 80% of survey respondents think screen scraping, an early data collection technique, will phase out as a common method to access bank data in the next 1-10 years, due to Open Banking. Almost 50% think it will happen within the next 1-5 years. Changes are imminent, requiring all parties to collaborate to create the right settings for an interoperable system that forms the foundation for more innovations.

## Will Open Banking remove screen scraping as a common method to access bank data?



From the survey we can see that Open Banking will be successful where data access is secure and fluid, and where the consumer can reap the benefits of innovation and increased data processing capability.

# COUNTRY PROFILES

Several countries across Asia-Pacific are profiled in this section. They have adopted different approaches to Open Banking, and are at various stages of development and implementation.

## 6.1 Singapore

Singapore has been an early adopter and leader of Open Banking and APIs in the Asia-Pacific region. This development was facilitated by regulators. In November 2016, the Monetary Authority of Singapore (MAS), the first regulator in the region to provide guidelines on Open Banking and to set out a framework for Open Banking, released the 'Finance-as-a-service: API Playbook', in conjunction with the Association of Banks in Singapore. The playbook was designed to provide guidance to all interested entities in developing open APIs. It provided guidance on information security standards and governance models for financial institutions and Fintech players.

In general, the Singaporean authorities have favoured an organic approach, with no specific timeline for compliance (Rothwell, Eroglu, McFarlane & Gagliardi, 2018). The MAS also took the lead by releasing APIs dealing with data regulations and operates a Financial Industry API Register, which tracks APIs by functional category as they are launched (Monetary Authority of Singapore, 2018). Many banks in the country have partnered with Fintechs to launch applications that use their APIs. DBS Bank and OCBC are the frontrunners in Open Banking among other Singaporean Banks, with DBS Banks leading with its platform of over 155 APIs across more than 20 categories (Fintech News, 2019).

Singapore will likely continue to be the pacesetter in Open Banking implementation in the region due to its proactive actions to foster creativity and competition. The country's vibrant Fintech ecosystem will also further boost their development in Open Banking. This is supported by Finastra's recent study which showed that 44% of Singapore's financial institutions are looking to deploy Fintech collaborations in the next 12 months – over double that in the United Kingdom (21%) and the United States (14%) (Khoury, 2019).

In 2018, Prime Minister Modi of India and the then Deputy Prime Minister of Singapore T Shanmugaratnam launched the Application Programming Interface Exchange (APIX), an initiative that would allow members to get closer to payments technology connectivity and testing opportunities. It is a global, open-architecture platform that supports financial innovation. The APIX serves as a marketplace that enables financial institutions to connect with a curated set of APIs from Fintechs all over the world. It also serves as a sandbox that provides an avenue for collaboration between financial institutions and Fintechs to collaborate and experiment in a controlled environment. APIX is an initiative of the ASEAN Financial Innovation Network (AFIN), a not-for-profit entity jointly formed by the MAS, World Bank Group's International Financial Corporation (IFC), and the ASEAN Bankers Association. In 2019, EPA Asia signed an MOU with APIX to help promote the adoption and use of Technical Sandboxes across the region.

These initiatives have begun to pay off. Singapore was ranked first in the Asia-Pacific region in the 2018 Finastra Open Banking Readiness Index . Singapore's high adoption of APIs was cited as one of the reasons for this ranking. In the same year, Singapore was ranked third globally by EY in their Open Banking Opportunity Index. The EY report that the high ranking is "driven by proactive efforts by the Monetary Authority of Singapore (MAS) to progress Open Banking since 2016, when it first published the application program interface (API) guidelines" .

While the MAS' enabling approach has been successful, at large, there are some areas where a more prescriptive approach could speed up the adoption of Open Banking. A legislative framework that lays out a common liability and complaints framework would be an important step in enabling adoption. Other measures include continuing to provide avenues for standardisation of APIs and enabling the evolution of common infrastructure and processes .

The need to integrate with different APIs without agreed upon standards and authentication methods may give rise to a new type of technical service provider - the aggregators, which have emerged to meet the same need in markets such as the US and the UK.

## 6.2 Hong Kong

The Hong Kong Monetary Authority (HKMA) has been pushing the local financial sector into the "Smart Banking" era (Accenture, 2019). The HKMA launched the Open API Framework in July 2018 in an effort to support Open Banking. Customer relations and data will be under control by the local banks according to the framework. At the moment, banks have the freedom to develop their specifications following the security standards from HKMA (The Asset, 2019).

The Open API Framework in Hong Kong is following four phases - namely Product Information (Phase I); Customer Acquisition (Phase II); Account Information (Phase III); and Transactions (Phase IV). In Phase One, third party providers can access bank information. It was achieved on schedule with 20 participating banks and more than 500 APIs available (Fintech News, 2019). By the end of 2019, participating banks entered Phase Two of Open APIs functions to accept new applications for banking services. Phase One and Two have focused on the banking institutions. Phase Three and Four will concentrate more on Third Party Providers (TPPs) and Fintechs. The HKMA is planning to deploy Phase Three and Four in 2020 and allow TPPs to process banking transactions. This decision will boost innovation and the development of new API strategies in collaboration between the different stakeholders. Some global banks in Hong Kong have been a step ahead with API strategies and collaboration - CitiBank partnered with Octopus, Hong Kong's leading closed-loop payment mechanism (Rothwell, 2018). On the other hand, some banks developed and released Open Banking products in partnership with selected Fintechs. For example, Bank of East Asia, in collaboration with Mastercard and QFTPAY, launched the i-Payment Hub, online and offline payment on a single platform (Rothwell, 2018).

As one of the emerging frontrunners in Asia-Pacific, Hong Kong has a step-by-step framework, guiding the financial institutions to an Open Banking ecosystem. The framework is liberal, which enables all parties to strategise on their next action.

## 6.3 South Korea

In South Korea, the Financial Services Commission (FSC) launched the regulatory sandbox scheme in April 2019 which has included a number of financial solutions as 'innovative financial services' in the sandbox, and Open Banking is part of the designated solutions suite. It should also be noted that the approach of the Seoul regional authorities appears to be supportive of development of a Fintech environment.

The FSC in Korea announced that it would establish legal foundations for Open Banking through revision of the Electronic Financial Transactions Act with a priority focus on safety and security in payments sectors.

A pilot Open Banking service was launched in Korea on 30 October 2019 with the participation of 10 banks. Through this initiative, customers were able to use nearly all banking services of these 10 local banks via a single mobile application. From 30 October 2019 to 18 December 2019, more than 3 million people registered more than 7 million accounts through Open Banking. As of 18 December 2019, Open Banking was launched for 16 banks and 31 Fintech business.

## 6.4 Australia

Open Banking in Australia has been mandated through the implementation of the Consumer Data Right (CDR) in the banking sector, which will be followed by the energy and telecommunications sectors in the future. Backed by the Treasury and the Australian Competition and Consumer Commission (ACCC), the release of data to be used in Open Banking will be executed in three phases (Deloitte, 2019). The four biggest banks are required to comply by releasing data APIs for the first set of account types by July 1st, 2020. Smaller banks will have to comply one year later, which allows them to learn from the experience of their larger counterparts.

In Australia, the CSIRO (Commonwealth Scientific and Industrial Research Organisation) has been focused on technical standards while ASIC (Australian Securities and Investments Commission) and ACCC (Australian Competition and Consumer Commission) have focused on financial sector consumer regulation respectively.

Standards on APIs are published by The Australian Data Standards Body (DSB), which sets guidelines and lays the foundation for companies to achieve one common standard of openness in APIs (The Paypers, 2019). This Data Standards Body, data61, is part of Australia's national research agency, and mostly funded by the Australian state. This means it can operate independently of banking industry funding, unlike in markets such as the UK, where the Open Banking Implementation Entity is mostly funded by the nine major banks.

The Fintech ecosystem has developed rapidly, going from fewer than a hundred to 579 companies in a five-year period. In addition, PwC recently reported that over 80% of financial companies are expecting an increase in Fintech partnerships. For example, FitBit's partnerships with 3 major banks (ANZ, Commonwealth Bank and NAB) has modified the conventional payment system through the launch of FitBit Pay (Australian Fintech).

Australia's regulatory efforts to develop Open Banking have increased competition and fostered innovations between the banks. The one-year gap in the phased approach between the major and smaller banks having to comply with Open Banking / CDR was intended to create a more level playing field. Standards set by the Data Standards Body on APIs help both banks with developing their APIs as well as data recipients to anticipate what they will be able to implement. Standardised APIs allow developers to design and implement apps that can interact with different banks (Nacha, 2018). Those apps will not need to be updated to accommodate various APIs. Increasing partnerships between Fintech companies and banks foster the creation of unprecedented products and services related to Open Banking.

Australia's near neighbour, New Zealand, has show progress though Payments NZ publishing its APIs for payment initiation and account information in March 2019, following an extensive pilot involving local banks and e-commerce players. Their API 2.0 standards will include consent and request to pay and are planned to be released in early 2020 and Payments NZ supports these activities through a robust API Centre."

## 6.5 India

Indian authorities endorsed the two-phase development of Open Banking. The first phase was related to payments, the second the transfers of financial data (IndiaCorpLaw, 2019). As a payment system, Open Banking is implemented through the Unified Payments Interface (UPI) governed by the Reserve Bank of India (RBI). It allows real-time fund transfers between bank accounts and mobile applications such as Google Pay, Paytm, and PhonePe which are operating through APIs launched by 150 'UPI Enabled' banks (The Paypers, 2019). The UPI facilitates inter-bank transaction as it establishes a digital identity of each consumers (Retail Insiders, 2019). The digital identity is made using the Aadhaar national biometric identification system. It is part of the India Stack project implemented by the Indian government whereby a set of open APIs are built to promote financial inclusion (Gilbert + Tobin, 2018).

Open Banking in relation to sharing of financial data will be managed by so-called non-banking financial company-account aggregators (NBFC-AA). NBFC-AA is an RBI licensed entity that acts as a link for interoperability between a bank and a Fintech firm (IndiaCorpLaw, 2019).

The required infrastructure and APIs have not yet been implemented by the banks. Although regulators support Open Banking, no firm guidelines around Open Data and APIs have yet been approved. However, the first NBFC-AAs received their licenses from the Reserve Bank of India in late 2019.

There is enormous potential for Open Banking in India, especially when the underlying challenges are addressed. The RBI estimated a growth of 4.4% in digital payments transaction turnover from 2019 to 2021. They are also very focused on the use of Open Banking to bring the informal economy into the formal economy, and improve access to cheaper and fairer credit. On the other hand, the set of challenges includes the prevalence of cash circulation in India's economy, sophisticated Know Your Customer regulations, and low smartphone ownership as compared to other emerging markets, and they should be included in the agenda for further discussion by the regulators (The Paypers, 2019).

## 6.6 Japan

Japan is a complex market when it comes to Open Banking, due to fragmentation of the financial sector and its unique regulatory regime. However, efforts by the government, banks, and Fintech companies show great promise and potential.

The 2018 revision to Japan's Banking Act clearly indicated the Japanese regulators' desire to introduce Open Banking. Prime Minister Shinzo Abe has set a target for at least 80 banks to have open APIs by mid-2020 and to date, 130 reported having plans to open up APIs by 2020 (Creehan, Tierno, 2019).

However, the long-standing negotiation regarding cost-sharing between banks and financial technology companies (especially ones which provide PFM (personal financial management) service to consumers)) appear to be contributing to slow progress in reaching an agreement. Japanese Financial Services Agency is steadily working on expending progress towards the Open Banking vision.

Meanwhile, Japanese banks have established partnerships without building the kind of API portals observed in other markets (Rothwell, 2018). Two of the country's biggest banks are embracing the Open API wave. In 2017, the Nikkei Asian Review reported that Japan's Mitsubishi UFJ Financial Group (MUFG) is planning to allow TPPs to access its data securely. Another significant development, in a similar theme to get things moving in Open Banking, is the agreement to launch a unified QR payment system between three important banks: MUFG, Sumitomo Mitsui and Mizuho (Raffone, 2019).

This use of APIs while also focusing on secure connectivity has allowed for beneficial customer solutions such as MoneyTree for example to allow new technology to help customers new ways.

Due to its cash-based economy, the focus of Open Banking in Japan is payments efficiency, and getting more benefit from moving away from cash. Banks' API strategies are turned towards digital payments and cashless transactions – a growing demand as the country prepares for the 2020 Tokyo Olympics (Rothwell, 2018).

# IMPLICATIONS AND RECOMMENDATIONS

There are common topics of considerations that cut across different stages of and approaches to Open Banking. They need to be considered carefully in order to architect an interoperable and innovative payments ecosystem.

## 7.1 Localised Frameworks for Regional Harmony

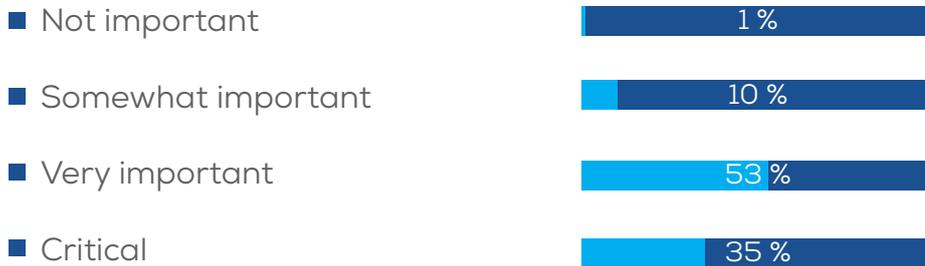
Three distinct models for regulator engagement have developed in Open Banking systems across the region: prescriptive (regulator-led), facilitated, and market-led. Every regulator sits somewhere on a spectrum between these two models of approach and all have adapted to their own particular regulatory and financial system environments.

Unlike the regulator-led approach in the EU, the approaches to Open Banking in the Asia-Pacific region have been more diverse. However, it is clear that the regulators in APAC are paying attention to developments across the region and similar topics are being considered.

There is a regulatory challenge in the Asia-Pacific in establishing Open Banking regulatory infrastructure that will allow for interoperability across the region. Companies in the Asia-Pacific region, both banks and Fintechs, tend to operate across multiple jurisdictions, and as a result, have to face the compliance burden of many different regulatory regimes. If the objective of Open Banking in the region is to rapidly scale financial inclusion and enable a new wave of financial innovation, it will be crucial to progress regulatory initiatives to allow Open Banking to be interoperable, both domestically and cross-border. 77% of our survey respondents believe that Open Banking will help to increase financial inclusion and get more people involved in payments. Amongst those who said that it wouldn't help enable financial inclusion, they think Open Banking will be impactful for mobile wallets and digital identity.

Furthermore, over half (53%) of survey respondents indicated interoperability in Open Banking in the same country is very important, and a similar portion (45%) considers interoperability in Open Banking across borders to be very important and a further 15% nominated this factor as critical. Indeed, the benefits to customers of Open Banking is dependent on the level of interoperability in the financial system. Seamless facilitation of cross border payments transactions and bank data consolidation were identified as key priority areas for the development of an effective Open Banking infrastructure.

## How important is interoperability in Open Banking in the same county?



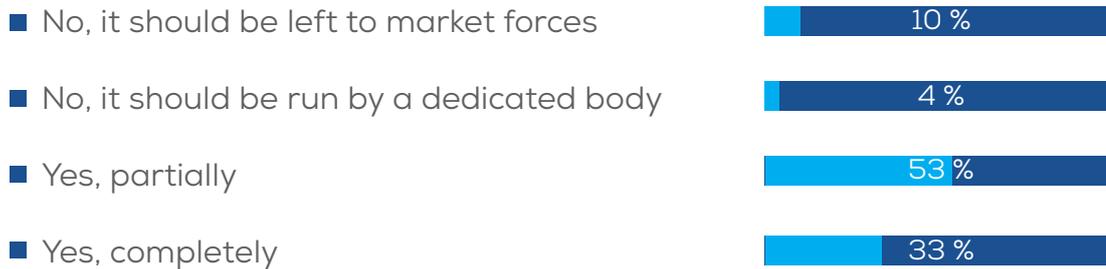
## How important is interoperability in Open Banking across borders?



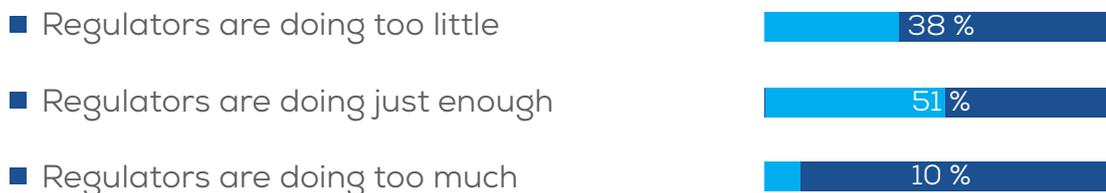
There are benefits and risks to all three of the Prescriptive, Facilitative and Market-Led approaches. The most appropriate choice for a given market will be the one that enables it to move towards interoperability and innovation in the most effective way. Only 10% of survey respondents think Open Banking should be completely left to market forces, and one-third (33%) of our survey respondents think that Open Banking should be completely regulator driven. Over half (53%) think Open Banking should be partially regulator driven; and over half (51%) think regulators are doing just enough to implement Open Banking in the region. A smaller group (38%) think regulators are doing too little, and 10% think regulators are doing too much.

As each jurisdiction determines and localises the Open Banking frameworks to their own context, there will be a need for a regional forum in which harmonisation of the technical regulatory specifications can be achieved across the region in relation to technical requirements for APIs and interoperability at the infrastructure level. Due to its wide membership and its inherent technical and commercial orientation, APEC would be the ideal suitable forum for kickstarting the conversation on technical interoperability.

## Should Open Banking be regulator-driven?



## To what extent are regulators working to implement Open Banking in your region?



Reconciling these approaches and deriving the best from each was a primary concern in the survey.

A parallel can be drawn with the development of the SWIFT system which arose through cross border cooperation in a very limited essential infrastructure issue, namely interoperability of communications between institutions. A similar approach is required for the interoperability of the APIs for Open Banking to achieve its full potential for financial inclusion.

# The case for ISO 20022

There are several elements to the matter of interoperability. One of them is the interoperability of the data elements – not only on a technical level but also on a semantic level. This is where the adoption of ISO 20022 as standard can bring substantial benefits to the creation of Open Banking APIs and other APIs for the financial industry. Well established in the banking industry, the standard allows for frictionless data exchange between API payload, back office systems, and interbank networks.

## What is ISO 20022?

ISO 20022 is a data dictionary-based standard created in 2003 for the financial industry. ISO 20022 is a methodology based on rigorous modelling of business transactions, during which a re-usable and technology-agnostic data dictionary is extended. For example, no matter the technology, a "360 days interest computation method" will have the same definition. Codes can be reused across technologies. The result of this modelling exercise is traditionally a set of XML messages, but it can equally well be expressed in other technical standards such as JSON for APIs, or whatever technology will become prevalent.

As the Registration Authority, SWIFT oversees the financial repository and safeguards the quality of the standard, ensuring consistency. Several other organisations and institutions have adopted the ISO 20022 methodology to create new message sets and thus added to the dictionary and message library.

More details on [www.iso20022.org](http://www.iso20022.org)

## The importance of ISO 20022 to the financial industry

The first wide adoption of the standard was for SEPA payments across Europe. Since then, nearly all payments and securities market infrastructures looking at renewing their systems have adopted or are adopting it for various business areas. The main reasons for adoption are international alignment, future proof underpinning, rich and open data structures.

In the region, it is or will be implemented by infrastructures in Hong Kong, China, India, Japan, Australia, Singapore, Thailand, Philippines. Globally, The Federal Reserve, DTCC, Bank of England and more have already adopted it. Specifically for payments, within the next 5 years, there will be an estimated 85% of the global value of payments happening using the ISO 20022 standard. In addition, the standard is used as the basis for instant payments systems such as FPS in Hong Kong, and NPP in Australia.

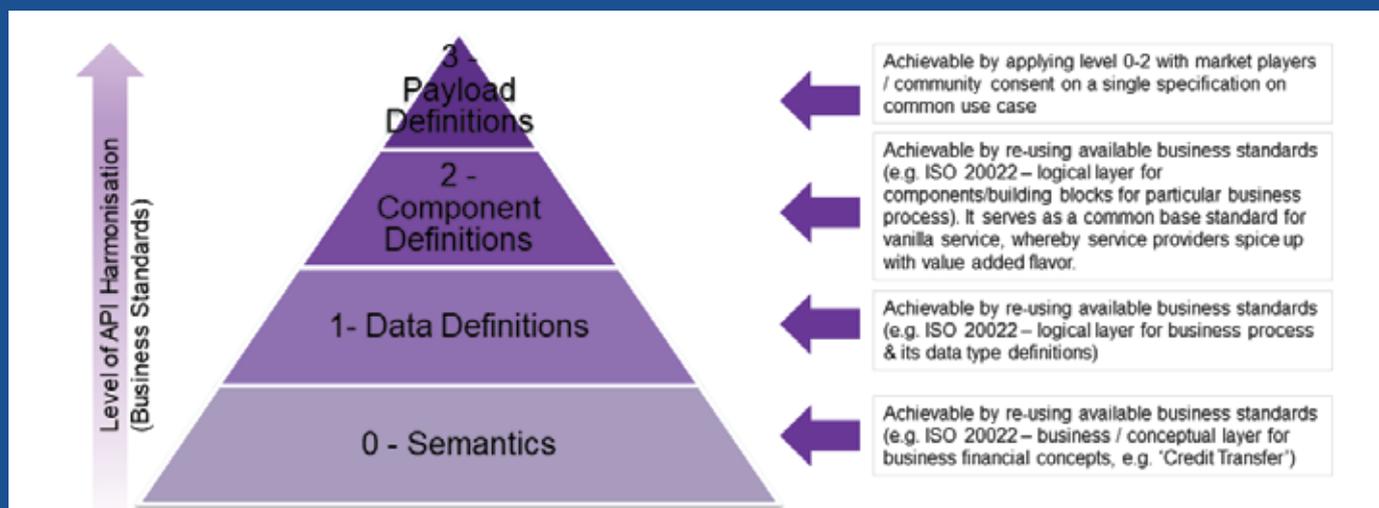
In addition to the above, to ensure end-to-end alignment without data quality loss, correspondent banking (cross-border payments) will also be migrating to ISO 20022, starting in November 2021. This will allow for rich end-to-end remittance information, granular party information improving screening, and data consistency.



## Using ISO 2022 for Open Banking APIs

In essence, when an API creator reuses the definitions, codes and restrictions (such as field length) of the ISO 2022 dictionary (accessible on [www.iso20022.org](http://www.iso20022.org)), the data can be transferred without friction or misunderstanding between the API, the banking systems and the interbank connections. For example, if you want to create an API that would initiate a real time payment in Hong Kong, it is important that your data elements are compatible with the underlying clearing and settlement systems (HK FPS). This is where ISO 2022 will ensure consistency. It is still possible that some local requirements do not have ISO elements foreseen (yet), however the API creator could submit these new concepts to the Registration Authority for extension of the dictionary.

The first use of ISO 2022 for Open Banking APIs happened in Europe. Many banks have ISO 2022-aligned back offices due to SEPA and several regional infrastructure projects. Working groups, including SWIFT standards experts, defined a universal set of reusable ISO 2022 resources. A tangible outcome is, for instance, the creation of an account status request API whose definition can be re-used all over Europe. Payment initiation may not be done with one single API payload definition due to local regulatory differences. However, the common set of resources or component sets are re-usable to achieve a good level of alignment and interoperability, as well as saving cost and effort for building the same use case from scratch. With this fundamental layer set, the financial industry can then build value added options or its own flavour on top of the base vanilla definition.



In APAC, ISO 20022-aligned APIs are being used for overlay services to the Australia NPP and, in Hong Kong, HSBC already published an ISO 20022-aligned direct debit API whose data can transition smoothly into the FPS.

## Going forward

ISO 20022 is the prevalent standard for payments as well as post-trade securities in the financial industry. API developers seeking alignment for easy adoption should NOT re-invent the wheel and rather re-use the existing ISO dictionary. In addition, broader adoption of the standard creates opportunities for APIs that can work across the region.

Issues of consent invariably arise in relation with customer identity verification, which undergirds most Anti-Money Laundering (AML) regulations. AML is a very sophisticated and well-developed area of financial services regulation. It is likely that regional interoperability in this regard could be examined separately through existing regional frameworks such as the intergovernmental Financial Action Task Force (FATF). It is worth noting that Japan, Hong Kong, Singapore, China, India and Korea are active participants in FATF and that a number of other Asian economies are monitored by FATF's International Cooperation Review Group. Progress has already been made to harmonise standards for "know your customer" "KYC" standards: FATF (Financial Action Task Force) Guidance on "Private Sector Information Sharing".

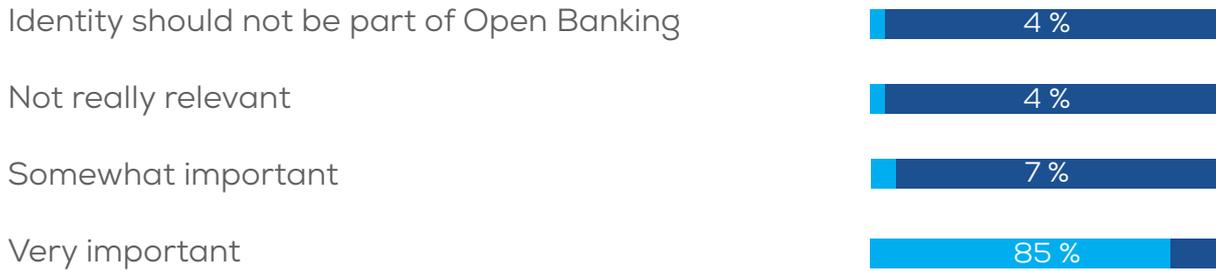
## 7.2 Regulation of Data Rights

Policymakers taking a prescriptive or facilitative approach will need to consider a wide range of issues with respect to data management. These issues include:

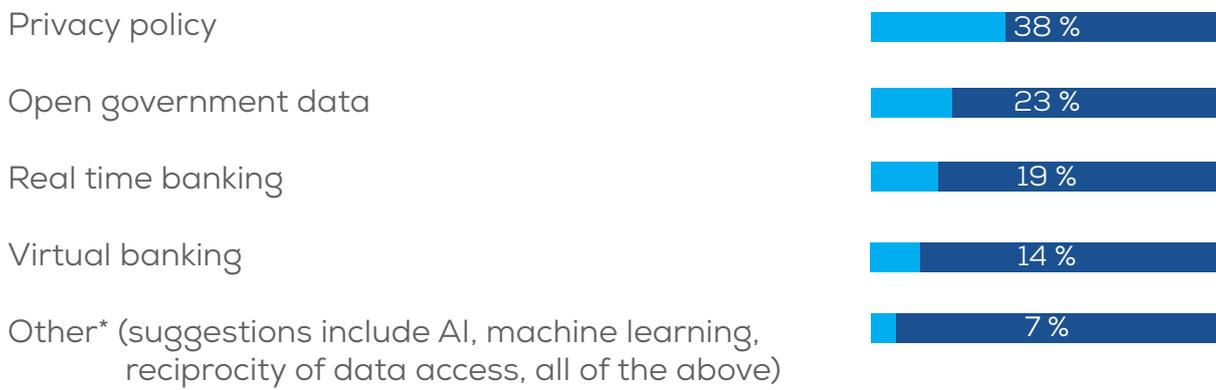
- clarity on data ownership and responsibility;
- how end-user consent is given, maintained and withdrawn;
- ensuring that the data is used only for appropriate purposes and for which the individual has given consent;
- privacy and security of any data held, viewed or used; and
- API specifications and data standards, etc.

In some jurisdictions in the region, such as Australia, Open Banking is part of a wider Consumer Data Right regime that will be extended to other sectors such as energy and telecommunications. This creates a choice for policymakers to determine whether Open Banking will be confined in financial services, or extended as a general right for consumers to control their own data across the economy. The choice will undoubtedly influence decisions such as which regulators will be responsible for controls and oversight.

## Role of identity in Open Banking



## Elements to be considered in Open Banking



To achieve interoperability and innovation, the regulation of data rights needs to be clear, comprehensive, and effective – making it easy for consumers to provide consent to third party providers while adequately protecting consumer’s rights with respect to privacy, security and their ability with a clear allocation of liability in instances of loss.

### 7.3 Oversight Architecture

Policymakers will need to make decisions around the responsible regulators overseeing the introduction and operation of Open Banking. Policymakers taking a Facilitative Approach may also want regulators to work with industry bodies, while a Market-Led Approach may see policymakers and/or regulators taking a “wait and see” approach.

Regardless of the approach, policymakers need to consider “who does what” – particularly if there are regulatory or oversight responsibilities that need to be allocated, to ensure the appropriate level of capability, capacity and coordination. Whether Open Banking is part of a wider consumer data right will also inform these sorts of decision rights allocated to regulators. These decisions may need to be subject to consultation with industry stakeholders with the ensuring regulatory architecture, possibly including a mix of public regulators, industry bodies and private entities.

Open Banking means that customers have greater control over their data, leading to better experiences. But it also opens up the possibility that data might be compromised and used for nefarious purposes – so ensuring it is protected and that there is a clear allocation of liability when things go wrong will be critical. According to our survey data, 69% of respondents said that they were at least somewhat concerned about the security of data access risks in Open Banking. 76% of respondents said they were at least somewhat concerned about risks related to the privacy of data in Open Banking. And 70% of respondents said that they are at least somewhat concerned about customer fraud risks in Open Banking. Supervision will likely need to be jointly performed, since Open Banking is multidisciplinary and warrants controls and monitoring related to data access risks, privacy, and fraud risks.

In the Asia-Pacific, different regulatory oversight architectures can be observed. In Singapore, which has taken a facilitative approach, the Monetary Authority of Singapore has taken a major role in driving regulatory change as well as organising major events, issuing playbooks and maintaining an API Register. In Australia, which has taken a more prescriptive approach, the responsibilities have been distributed between a number of regulators including the Australian Competition and Consumer Commission, the Office of the Australian Information Commissioner and the CSIRO's Data61.

To achieve interoperability and innovation, the oversight architecture needs to be easy for third parties to navigate (for example, if they need to register), with adequate coverage and clarity around who is responsible for what. Regulators also need to be adequately resourced with the right kinds of skills and, if multiple regulators are involved, there needs to be active coordination.

## 7.4 Issues of Outdated Infrastructure

Policymakers may be confronted with existing infrastructure within banks that may not be adequate to support an innovative and interoperable Open Banking regime. API specifications and data standards need to speak to payments infrastructures – warranting the adoption of open standards – as well as bank's own systems.

Where Open Banking is extended to payment initiation, existing payment infrastructure may not be equipped to support this extension. Consideration may be required on whether existing payment infrastructure needs to be enhanced or new infrastructure created to support real-time payments based on open standards. Banks themselves may also need to upgrade or update their own systems to accommodate API integration and manage consent.

## 7.5 Cyber Hygiene, Education and Awareness

According to our survey, over half of respondents said trust/concerns about data sharing was the main barrier to developments in Open Banking, followed by lack of knowledge, customer preparedness, regulations and infrastructure. These hint at the importance of transparent communication and proactive education efforts, in addition to lay the foundation for adoption.

### Barriers to Development

Trust/ Concerns about data sharing	52 %
Lack of knowledge	33 %
Customer preparedness	31 %
Regulations	30 %
Infrastructure	30 %

# CONCLUSION

The diversity, experimentation and adaptation seen within the Asia-Pacific and globally, combined with the potential to bring about significant consumer benefits signifies that we are still in a very early phase for Open Banking.

The survey highlights some key focus areas for the future. This includes the importance of interoperability (including supporting cross-border capabilities), innovation, data standards and an appropriate role for regulators.

While consistency and standardisation have benefits, this objective needs to be grounded in the evaluation of how greater interoperability can be achieved. Consistency and standardisation should also take the local context, changing market needs, and evolving technology into account.

The diversity across the region means harmonisation around the regulation of banking, privacy or data or the scope of Open Banking in the immediate future challenging and unlikely. However, it highlights the importance and opportunity of fostering bilateral or multilateral recognition and partnership. One undertaking could be building consistency around API technical standards, which is highly desirable and beneficial.

Interoperability – in terms of recognition and standards – are important steps both within national markets and across the region. Learning from each other and deepening our understanding of what works and what doesn't will be critical.

Some of the lessons to date would suggest that policymakers and industry decision-makers should consider the merits of:

- Coordination and leadership of regulators, central banks and government agencies across the region
- An inclusive consultation and implementation processes that goes beyond “big banks” to also involve smaller institutions, new entrants and Fintechs. Support initiatives like the technology sandbox initiatives.
- Development of APIs with consideration of what has been done in other jurisdictions (for example, Australia leveraged the UK standards)
- Development of rules and regulations that support APIs – recognizing that Open Banking is more than a technology solution, but also an ecosystem and infrastructure.
- Consideration of Faster Payment, Digital Identity and Consent Management initiative that will support Open Banking

## Selected Bibliography

Association of Banks in Singapore / Monetary Authority of Singapore Financial World – Finance-as-a Service: API Playbook.

<https://www.mas.gov.sg/development/fintech/technologies---apis>

Basel Committee on Banking Supervision (2019) Report on open banking and application programming interfaces, Bank for International Settlements, November 2019.

<https://www.bis.org/bcbs/publ/d486.htm>

Commonwealth of Australia (2017) Review into Open Banking: giving customers choice, convenience and confidence, December 2017.

<https://treasury.gov.au/consultation/c2018-t247313>

Creehan, Sean and Paul Tierno (2019) "The Slow Introduction of Open Banking and APIs in Japan". Pacific Exchanges Podcast. Federal Reserve of Bank of San Francisco. 2 May 2019.

<https://www.frbsf.org/banking/asia-program/pacific-exchanges-podcast/open-banking-apis-japan/>

Deloitte (2019) "Open Banking: Switch or Stick? Insights into customer switching behaviour and trust", October 2019.

<https://www2.deloitte.com/au/en/pages/financial-services/articles/open-banking-survey-2019.html>

Finastra (2018) Finastra Open Banking Readiness Index.

<https://www.finastra.com/solutions/innovation/open-banking-readiness-index>

Gilbert + Tobin (2018) "Open Banking Regimes Across the Globe" September 2018.

<https://www.gtlaw.com.au/insights/open-banking-regimes-across-globe>

IDC (2019) "IDC Financial Insights Releases Complete Guide to Open Banking for Banks with Five Report Series on Open Banking", November 2018.

<https://www.idc.com/getdoc.jsp?containerId=prAP44449418>

Marous, Jim (2019) "Top 10 Retail Banking Trends and Predictions For 2019", January 2019.

<https://thefinancialbrand.com/78423/2019-top-banking-trends-predictions-outlook-digital-fintech-data-ai-cx-payments-tech/>

Microsoft, Linklaters and Accenture (2019) Open banking: A shared opportunity, November 2019. <https://news.microsoft.com/apac/2019/11/11/financial-services-and-digital-technologies-microsoft-advances-the-discussion-on-responsible-ai-and-open-banking/>

## Selected Bibliography

Open Data Institute and Fingleton (2019) Open banking, Preparing for lift off, July 2019.  
<https://www.openbanking.org.uk/wp-content/uploads/open-banking-report-150719.pdf>

Raffone, Maurizio (2019) "How fintech is developing in Asia? Interview with Maurizio Raffone, CEO Finetiq"  
<https://www.fintastico.com/blog/how-fintech-asia-interview-maurizio-raffone-finetiq/>

Rothwell, Graham, Hakan Eroglu, Andrew McFarlane and Luca Gagliardi (2018) Open up Commercial Banking: The Brave New World of Open Banking in APAC, Accenture Consulting, 2018.

[https://www.accenture.com/\\_acnmedia/pdf-87/accenture-opening-up-commerical-banking-apac.pdf](https://www.accenture.com/_acnmedia/pdf-87/accenture-opening-up-commerical-banking-apac.pdf)

Thomas, Hamish (2018) "EY Open Banking Opportunity Index: where open banking is set to thrive" Ernst and Young, October 2018

[https://www.ey.com/en\\_gl/banking-capital-markets/ey-open-banking-opportunity-index-where-open-banking-is-set-to-thrive](https://www.ey.com/en_gl/banking-capital-markets/ey-open-banking-opportunity-index-where-open-banking-is-set-to-thrive)



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