



TEMENOS
THE BANKING SOFTWARE COMPANY

Open Banking and The Rise of Banking-as-a-Service



I Contents

Introduction.....	3
1. Structural Change – Disintermediation of the Banking Value Chain.....	4
2. Open Banking Across the World.....	7
3. New Business Models.....	10
4. Open banking-driven Innovation – Tangible Customer Value.....	13
5. Embedded Finance and Banking-as-a-Service.....	21
6. Technology implications of Open Banking and BaaS.....	26
Conclusion.....	29



I Introduction

Since its inception in 2018 in Europe through regulatory initiatives like the Second Payments Services Directive (PSD2) and Open Banking Standard in the UK, open banking has spread across more than 50 countries in the world. From a typical compliance exercise, it has evolved into one about developing innovative customer propositions for both retail consumers and businesses alike. Open APIs have become the standard of collaboration in an increasingly busy financial ecosystem where banks, neobanks, fintechs, payment disruptors and the ecommerce and technology giants strive for dominance in different parts of the banking value chain; a value chain that has fragmented along manufacturing and distribution. Banks are exploiting open banking to experiment with new business models to break into new markets, to consolidate market share in mature markets, or to defend against aggressive new entrants in others.

We are now seeing the rise of embedded finance, the demand for a unified customer-centric digital platform to deliver both, financial and non-financial products and services. Embedded or open finance (Open X) which includes not just mandated accounts and payments but all financial products such as mortgages, loans, pensions and insurance, creates even more opportunities for innovation. As embedded finance is spreading

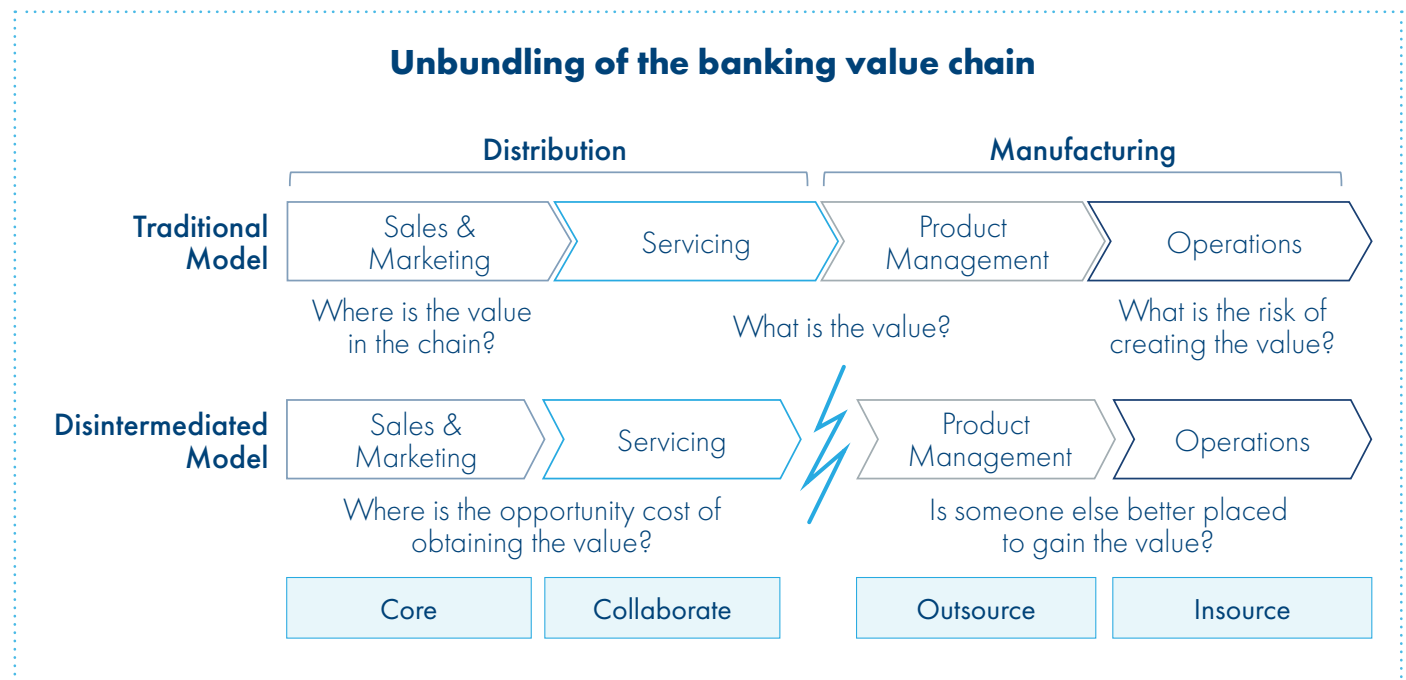
to all consumer-facing brands, a particular new trend is gaining ground: Banking-as-a-service (BaaS), which has arisen under the umbrella of the open banking framework. BaaS offers a radically different approach to financial services—one that deconstructs the old, traditional model and places its building blocks in the hands of a wider range of stakeholders.

Modern technology is a prerequisite for success in open banking and even more so, in participation in the BaaS world. All players in the open banking eco-system, banks as well as nimble new BaaS providers or the fintech or technology brands consuming BaaS, require a resilient, secure and scalable technology platform that is cloud-native, API-first, built on microservices and enabled by AI. In order to succeed in open banking, incumbent banks running on legacy-based architectures need to digitally transform by acquiring critical new technology capabilities, enabled by partnerships with innovative banking software vendors as well as public cloud providers.



Structural Change – Disintermediation of the Retail Banking Chain

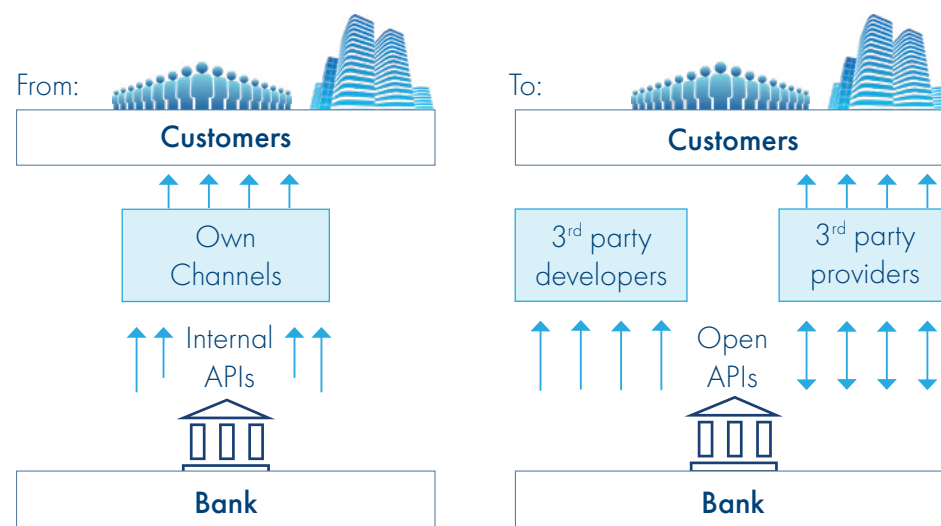
The chipping away of the banking value chain by non-traditional players plus the widespread consumption of digital banking services by technologically savvy, less loyal customers, combined with the high costs of operation of incumbent banks mean that the end-to-end manufacturing and distribution of banking services entirely within a bank will continue to decrease, and that manufacturing and distribution will continue to diverge making it necessary for banks to collaborate with other players of the eco-system, be they fintechs, technology giants, telcos, retailers or other banks. This unbundling of the banking value chain will only gather pace, as the disruptive technologies mature in financial services.



Banks need to assess which elements of their value chain truly add value to the end customer and which do not, how much value is created, what are the associated risks and costs and what are the opportunity costs of divestment. Accordingly, banks may decide to focus on certain processes themselves, may consider outsourcing and other innovative partnership models for sections of their value chain or may in-source certain business from other banks, leveraging economies of scale and leading to the rise of new utility models in the industry.

Open Banking is the resulting global phenomenon of the disintermediation of the value chain and the move from competition to collaboration with other players in a wider eco-system. It is a collaborative model in which banking data is shared between two or more unaffiliated parties through APIs in a bid to deliver enhanced capabilities to the end-customer. The third parties could be service providers or technology developers. The use of APIs as opposed to non-standard ways such as screen-scraping or manual downloads, improves the speed, ease and security of collaborating with third parties. It makes data, algorithms, transactions, business processes and functionality available to other players in the banking eco-system.

Open banking - A collaborative model based on sharing of data through APIs



63%

of financial executives say their organization's Open Banking spending increased since 2019

Source: Tink 2020

73%

of UK financial executives have a positive attitude to open banking compared to 48% in 2019

Source: Tink 2020



//

With Temenos, we can pursue new and untapped market opportunities with differentiated products and services that will put us at the forefront of **Open Banking and Payments modernization** opportunities. We look forward to continuing to innovate with Temenos."

Chris Catliff

President and CEO, BlueShore Financial, Canada



//

This is an exciting time for us. Cloud offers the enhanced scalability and flexibility we need to pursue aggressive growth plans, while we can see real security benefits from modern public cloud infrastructure. **Open Banking offers a real opportunity for us**, too, and Temenos will be our first port of call when we kick off these initiatives."

Dan Dickensen

Former CIO, EQ (Equitable) Bank, Canada



//

As we move into a new phase in our banking journey, we are sure that the partnership with Temenos will continue to contribute to our success, helping us to adapt to evolving regulations and market conditions and embrace the **opportunities created by Open Banking**. We are confident that the self-service capabilities, rich integration features to connect to third-party solutions, STP, and scalability of Temenos solutions will enable us to grow and enhance our services."

Mark Sawyer

General Manager, MyLife MyFinance, Australia



Open Banking Across the World

2

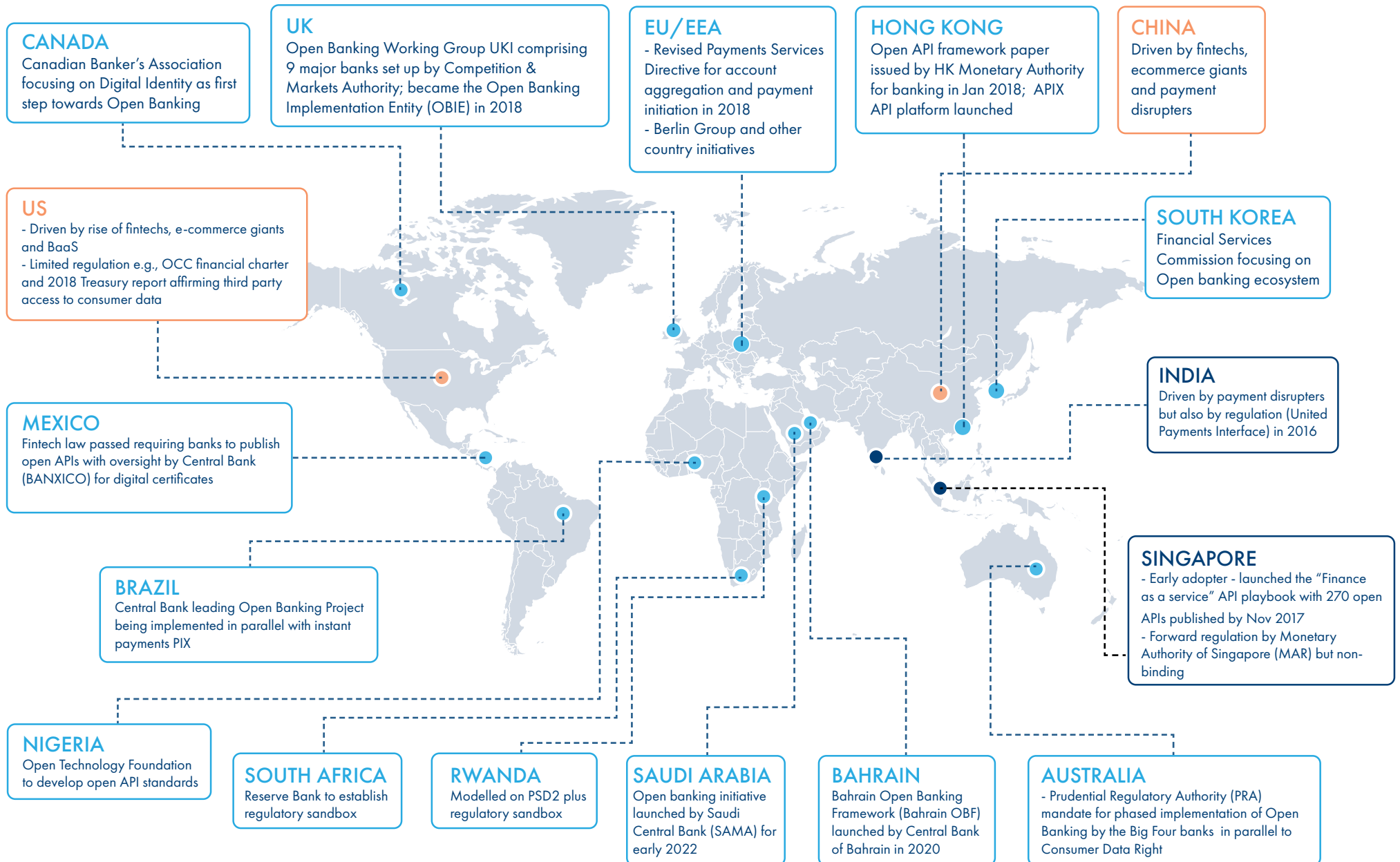
While PSD2 in Europe and the UK's Open Banking Standard launched by the Competition and Markets Authority, are the pioneering initiatives started three years ago to promote competition and innovation in the industry, at least 50 countries across the world are now well on the path to open banking. Some are opting for a more regulatory-driven approach modelled on Europe and UK such as Australia, Canada and Hong Kong and more recently, Brazil and Mexico in Latin America and Bahrain and Saudi Arabia in the Middle East, with mandated API standards and data access. Others are following a more market-driven approach such as the US driven by the rise of nimble fintech challengers and those in Asia like China and India driven by payment disrupters and ecommerce giants.

Amongst the regulated markets, Australia stands out from the crowd for having the most ambitious and innovative approach to open banking. Australia's Prudential Regulatory Authority mandated open banking implementation for its Big Four Banks along the lines of the UK but moved beyond open banking by implementing in parallel the Consumer Data Right, an open data economy whereby citizens cannot only request financial institutions to share their data with third party providers of financial services but also companies in other sectors like energy or telecoms.

Canada is another example where the Banker's Association has been focussing on digital identity as a precursor to an Open Banking Framework. It has now started the second phase of its "consumer-directed finance" consultation on open banking.

Amongst the market driven ones, China is an interesting example where giants like Alipay and WeChat Pay exploited their huge social media and gaming platforms and customer bases to embed financial services like wealth and AI-driven lending into their platforms. They needed to develop payment systems in a country where credit card penetration is low. They were able to do this and expand beyond payments under a relatively benign regulatory regime at the time, and with a more receptive customer base. Today, Alipay is rapidly expanding beyond China to European markets with the goal of having two billion users in the next decade.

A snapshot of Open Banking across the globe



Open Banking Implementation Entity (OBIE)

Case Study

In the UK, the Open Banking Working Group, a consortium of 9 high street banks, was set up in 2015 by HM Treasury to develop the Open Banking Standard, a framework to guide how Open Banking data should be created, securely shared and used by its owners and those who access it using open APIs. The intention was to develop common technology, security and data protection standards across the industry for open data such as current account terms and conditions or credit data, so as to maximize its potential value through reuse. In addition, the UK's Competition and Markets Authority (CMA) published a report in late 2016 requiring banks to implement open banking by 2018 in order to accelerate technological change in UK banking and to help new entrants compete more fairly with the larger incumbent banks. The UK's Open Banking Implementation Entity (OBIE) was established at the same time. Funded by the industry and operating under the aegis of the CMA, it is a central programme and platform that supervises the implementation of open banking in the UK, champions the open banking ecosystem and provides critical infrastructure services to that ecosystem such as directory security and dispute management services.

OBIE has been instrumental in the development of Open Banking in the UK and is widely seen as a success by the rest of the world including Europe with its PSD2. By December 2020, it had more than 300 regulated providers, including fintechs, in the ecosystem with 102 having live offerings in the market through the Open Banking App Store. Another 450 are in the pipeline. More than 3 million UK consumers and businesses now use open banking-enabled products to manage their finances, access credit and make payments and API call volume has increased from 66.8 million in 2018 to nearly 6 billion in 2020. The focus of OBIE now is delivering true customer value, going beyond the regulatory mandate by creating a premium set of services on top of the existing regulatory API framework and standards, which will be targeted at specific use cases. "That's when it really takes off: all the data in one place built around serving the consumer," said Imran Gulamhuseinwala, the Trustee of OBIE.

The app store run by the UK's OBIE currently has 100+ different open banking mobile applications and online products across consumer, business and technical services.

New Business Models

Open banking is leading banks to co-exist with and co-evolve with multiple players in the banking eco-system. Open banking has seen the traditional full-service bank morph into new business models such as the 'aggregator or distributor' where the bank sells third-party products to its own customers, the 'manufacturer' where the bank sells its own products to other customer-facing institutions, or the 'platform' where the bank facilitates the exchange of financial products and services between multiple distributors and manufacturers.

In reality, banks will pursue a multitude of these business models depending on their business strategy and market position in different business segments and geographies.

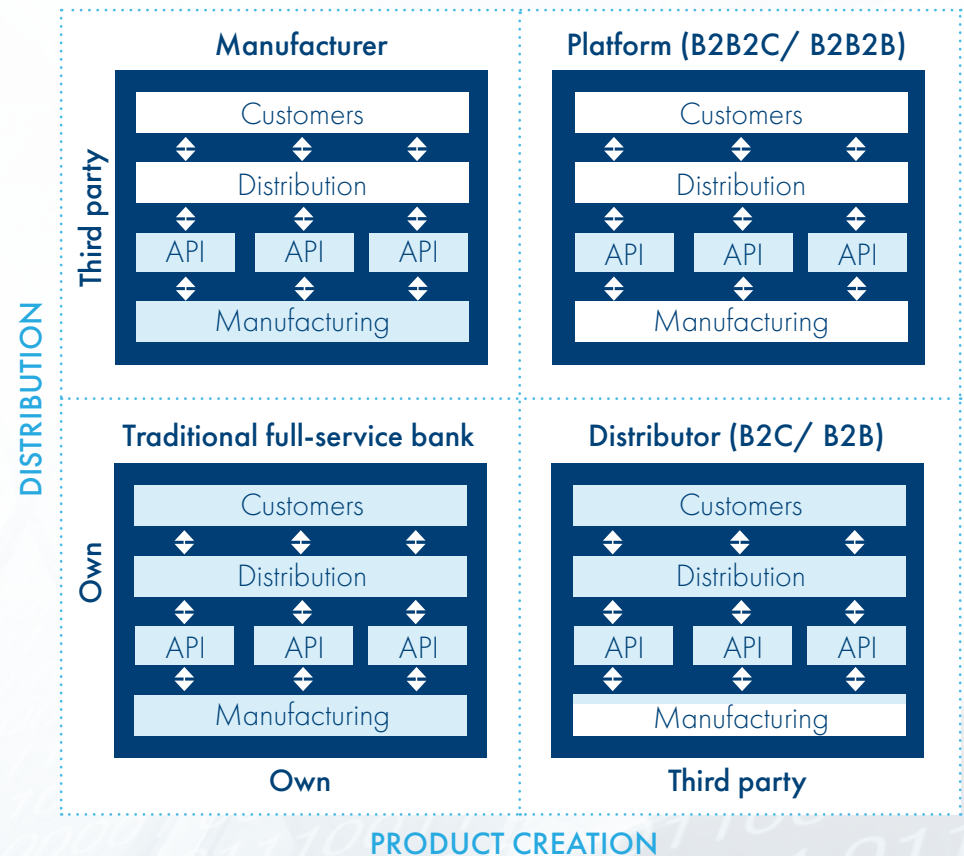
In markets where they dominate, they may choose to provide a full front-to-back-service as well as aggregate 3rd party products to build their own digital ecosystems. **Citi** bank has recently launched a digital lending platform designed to provide access to credit to SMEs looking for loans for up to \$10 million to connect seamlessly with several regional, local and community banks. **Idea** bank in Poland has built a similar eco-system for SMEs and start-ups but providing accounting, cash flow analytics, promotion support and even book-keeping for Uber drivers. **Gobank** in the US teamed up with Uber to offer banking services on the ride-sharing platform gaining access to Uber's vast customer base. To enter new markets, banks may decide to offer their services to third-party distributors or participate in an existing eco-system.

46.6%

of respondents want to act as a true digital ecosystem (offering own and third-party banking and non-banking products and services to own customers as well as to other financial services organisations)

Source: EIU Report 2021

Open Banking Business Models (inspired by the European Banking Association)



The ecommerce and technology giants like **Amazon, Rakuten, Ant Financial** and **Tencent** first merged the value chains of various industries to offer financial services from platforms. Being more central to their customers' lives and better able to exploit the mountains of incredibly valuable customer data they owned enabled them to do so. Many banks today aspire to create a platform like Airbnb or Google or WeChat i.e. to enable transactions between buyers and sellers for transactions across different related businesses offering a shared solution, within the context of a well-defined value proposition under their own brand with the value being generated by the transactions themselves.

In the context of retail banking, such a platform could be around a lifestyle proposition such as buying a new home, with the bank orchestrating not just financial services but also services that help the customer insure, renovate and furnish the new home all integrated into the bank's platform. For businesses, an example of a platform is **RBC's Ownr** which offers end-to-end administrative, regulatory and advisory services to entrepreneurs setting up and managing a new business in Canada from registering the business as a sole proprietorship or an incorporation to building the brand and helping with business insights. With such a model offering a one-stop shop of personalized services, a customer is more likely to remain within the platform ecosystem.

Percent of respondents who trust big tech to handle financial needs:



Source: McKinsey - Future of Banking Consumer Survey July 2019

A large bank in Europe embarked on a digital transformation with Temenos to deploy cloud-native Temenos Transact and Infinity. The new technology platform not only enables the bank to improve operating efficiency but also allows them to participate in third party eco-systems to create new revenue streams and distribution channels whether in real estate or car dealership or a home moving company.

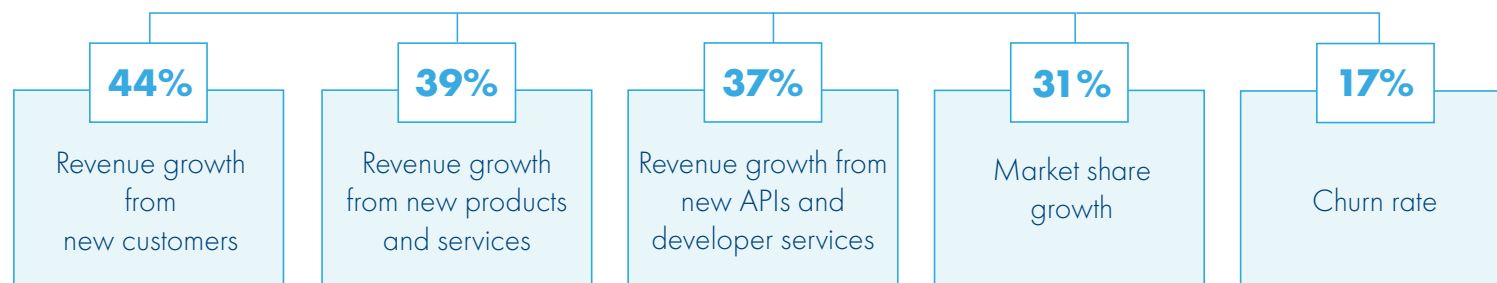




Increasingly favourable customer attitudes towards banking with brands like Google and Amazon combined with the truly digital and compelling propositions that these giants and other disruptors provide, imply a significant erosion of the banking revenue pool. Citi predicts a loss in business volumes of up to 50% in payments and investments and up to 35% in consumer and business lending and mortgages to new entrants by 2025¹. This means that banks have to act fast to maintain and gain market share in the world of open banking where proprietary data is no longer the source of competitive advantage it once was.

However, banks have several historic advantages – rich transaction data, trusted client relationships, compliance prowess and capital – that they could exploit to create their own platforms. McKinsey estimates that banks that can capture a share of some non-banking markets through the platform model could elevate their ROE by ~5% above the current industry average².

Top Benefits to Banks from Open Banking



Source: Tink 2020

1. Citi Research Global Digital Strategy "Bang and Fuse" Model
2. McKinsey: Remaking the bank for an eco-system world October 2017

Open banking-driven Innovation – Tangible Customer Value

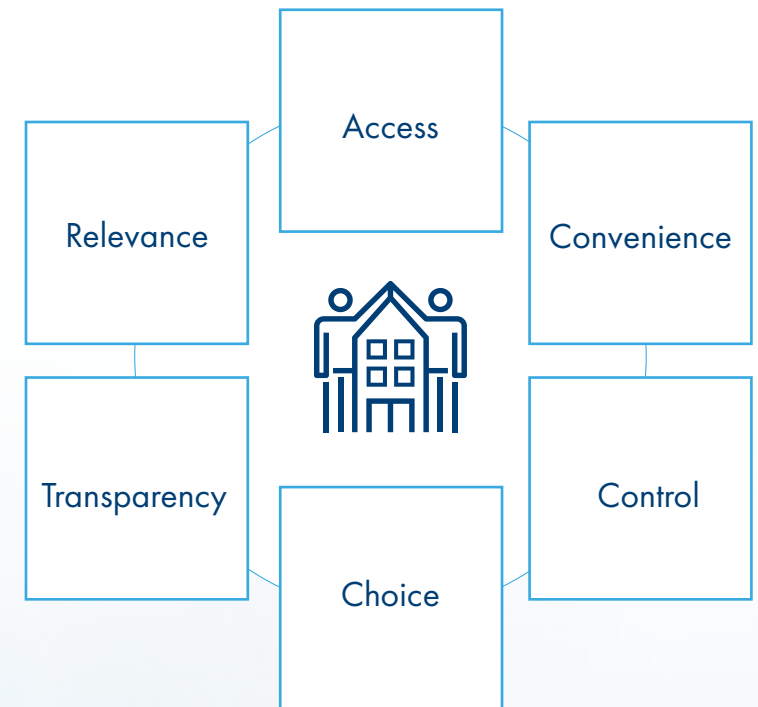
4

Open banking continues to be driven by the original regulatory objectives of increasing competition and accelerating innovation using APIs. Despite PSD2 having a very limited focus, and while the regulation has not yet had the impact many had hoped for, the concept of using open APIs has had a transformative impact on the industry as market leaders, both incumbent banks and new entrants, go beyond the regulation to provide innovative experiences and products to consumers and businesses alike, giving them more choice and greater control over which financial products and services they consume and from whom.

Open banking's ultimate success depends on end-customers' awareness and acceptance which in turn depends on the additional tangible benefits it brings – greater personalization, a better experience with improved convenience and responsiveness, more transparency, and access where none existed. Financial services providers need to go beyond mere account switching and aggregation to provide next-generation financial services not only to existing customers but also extend their reach to under-served or unbanked segments, by accessing and mining open banking data from multiple third-parties in addition to their own. For instance, many providers are using open banking to extend private banking to the mass affluent and ultimately mass retail segments and extend corporate banking to the underserved SME segment. In the UK, open banking is progressing beyond accounts to other areas of finance such as savings, mortgages and even pensions and insurance which is being referred to as Open Finance or Open X.

Banks are starting to leverage open banking for retail, SME and corporate customers with rich use cases emerging in all segments.

The benefits to the end customer and/or business

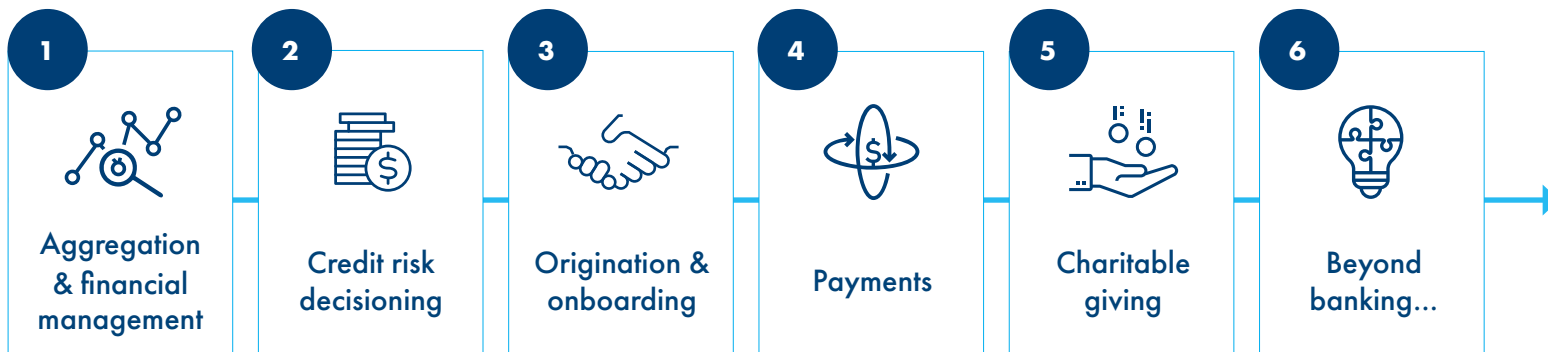




Retail Banking

Retail consumers were the first target for open banking and compelling use cases for end-consumers are emerging rapidly, ranging from aggregation and personal financial management to beyond banking.

Retail Banking use cases



The Temenos MarketPlace has a strong retail banking hub across Europe that we are excited to become a part of. By adding our open banking platform with deep bank connectivity, we can help banks in the Temenos community seamlessly access real-time, enriched financial data, enabling them to get a better understanding of their customers' finances, and to build new digital services that help people better manage their money."

Daniel Kjellén,
Co-founder and CEO of Tink



1. Aggregation and financial management:

Already, open banking is helping retail customers manage all of their personal finances in one place, giving them a holistic view of their financial footprint plus access to faster, cheaper credit, and personalized advice on managing debt or the best mortgages to buy. **HSBC, KBC, OP Bank** have all launched aggregator apps in recent years. Aggregator and personal financial management apps have now extended their scope to include new services such as targeting recommendations for restaurants, attractions and activities based on previous financial behaviour. **Natwest** and Swedish fintech **Tink**³ have partnered on a spending feature on **Natwest**'s mobile banking app used by 4.6 million customers to control finances. In July 2020, a personalized and actionable newsfeed was added to this app which has helped 1.6 million customers save money.

ABN Amro has also collaborated with **Tink** to develop **Grip**, a PFM application that allows customers to view their consolidated finances from other banks. Within 3 months of launch, they had attracted 670,000 customers, 50% of whom reported improved perception of the bank.



2. Credit risk decisioning: Credit risk decisioning for loans and mortgages is being transformed by automating and incorporating open banking data like shopping history in addition to static credit reference agency data, allowing customers to receive bespoke, fairer offers faster and more cheaply, while the providers benefit from operational cost savings, reduced fraud, and better lending decisions. Platforms like **DirectID** categorize open banking data such as salary, debts and affordability to provide visual insights on the creditworthiness of the applicant. This can allow people with no credit history like young people, new immigrants or the self-employed access to credit they would not otherwise receive. The not-for-profit lender, **Fair for You**, uses open banking to enable low income families to access credit.



3. Origination and onboarding: Disruptive technologies like AI and machine learning and Robotic Process Automation (RPA) can be applied to open banking data to simplify and dramatically improve the origination experience. Fintechs like **Habito** and **Trussle** are already doing this for mortgages. Even for account originations, access to open banking data can reduce exceptions and hence reduce dropout rates in the application process through automated verification. The same principles apply to tenant applications for rentals.

3. Tink has built its business model on open banking in Europe, offering account aggregation, personal financial management and payment initiation services to banks in 13 European markets. It is connected to 3400 banks and FIs.



4. Payments: Payments are being revolutionized not just by open banking but by new formats and methods such as QR Codes, P2P payments and cryptocurrencies to reduce friction and improve the consumer experience. New firms such as **Adyen** are complementing existing technology firms such as **Stripe** and **PayPal** in this space.



5. Charitable giving: Charitable giving is an area adjacent to banking that is seeing the positive effects of open banking. **Sustainably** is a fintech that allows users to roundup their digital spare change from shopping and debit card use towards charitable giving. **Moneyhub Enterprise** and **Streeva** are powering charity donations by scanning QR codes with a phone to allow direct payment with automated Giftaid. **Santander's Openbank** recently launched a charity marketplace. "Customers can go to the website, select a charity, set up an automatic transfer every month or year, and receive a tax receipt", said their CEO, Ezequiel Szafor, recently.



6. Beyond banking: Open banking could be extended into completely new areas outside banking and finance like managing all of a customer's passwords from the bank's portal. Imran Gulamhuseinwala, implementation trustee at the OBIE, uses the example of an app leveraging open banking data to help people better understand their carbon footprint and make better environmental decisions.

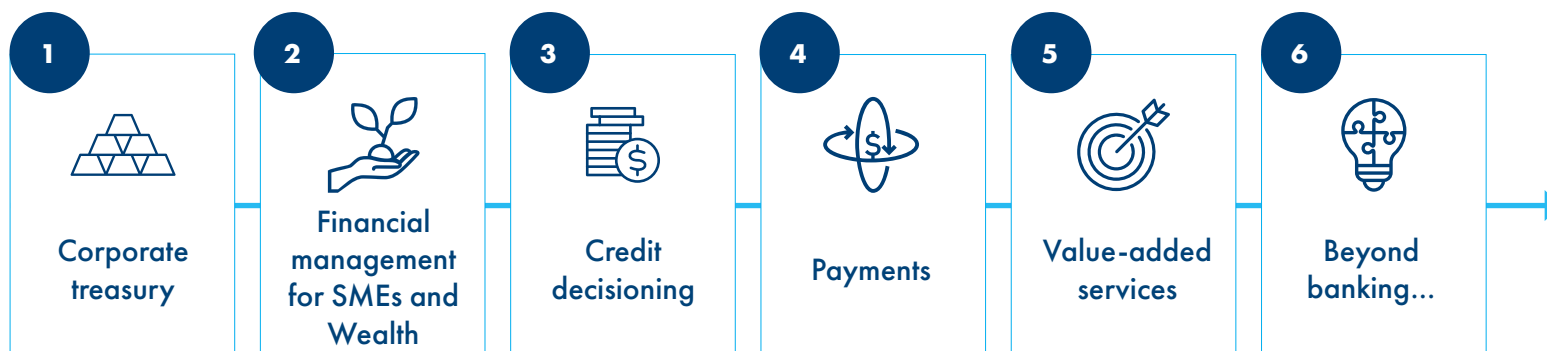




Corporate/ SME Banking

Open Banking can also help small and medium enterprises (SMEs) and corporates all the way from corporate treasury to payments, credit access, account opening and operations to beyond banking. It helps in reducing costs, enables better decision making and improves compliance.

Corporate/ SME Banking use cases





1. Corporate treasury: Open banking offers significant benefits to the corporate treasury function. It enables real-time integration between the corporate's ERP and treasury systems and the bank, greatly enhancing visibility for both the bank and the corporate treasury. Corporates meanwhile can use open banking to access real-time transactions and balances from their multiple banking relationships to have enhanced and timely visibility on their cash and FX positions globally, rather than end-of-day MT940 or MT92 statements, for instance. This helps corporate treasurers manage their liquidity more effectively.



2. Financial management for SMEs and Wealth: Open banking is especially useful to SMEs as it allows them access to the same technology benefits that were previously only available to larger, well-resourced corporate organizations. For example, a single open banking API can enable smaller treasury teams to access the online portals of multiple banks with their own specific ways of downloading information, which can be much more cost-effective than SWIFT. This offers greater choice and easy comparison of different products and services available specific to the SME's sector and market. Open banking data can enable account aggregation or book-keeping and financial management as well as the ability to improve credit checking of customers and integrate accounting and lending. Improved visibility and analytics into cashflow against forecasts helps manage late payments. In the UK, **Barclays**, **HSBC**, **Lloyds**, and **RBS** all offer SMEs and middle-market clients products for aggregated cash management. In Central Europe, **OTP bank** recently launched **eBiz**, a financial management tool for SMEs. New players like **Tide**, **Holvi**, **Plaid** and **Coconut** also offer aggregation solutions, mostly focused on accounting and bookkeeping, with payment tracking, tax calculation, and invoice preparation to SMEs and freelancers. Others like **VisibleCapital** provide improved insights on private clients financial advisors, wealth managers and pension providers.



3. Credit decisioning: Banks can use open banking APIs to access accounts payable and receivable transaction data in real-time as well as invoice history from their corporate clients in addition to balance sheet and credit registry data, allowing them to make better-informed credit decisions and accordingly tailor their propositions to the corporate's specific business context, proactively offering appropriate hedging and other working capital products as pre-approved lines of credit. **CreditPassport** is a fintech providing credit scoring for businesses.



4. Payments: Banks can initiate payments on behalf of SMEs and corporates to maximize returns and reduce funding costs by offering alternatives to card payments. Fintechs like **Plaid** are already offering payment initiation services for SMEs. **Klarna** is an ecommerce payments solution for businesses and merchants. Open banking enables corporates and SMEs to enhance their own customer relationships i.e. the experience they are able to offer their end-customers in terms of the speed of fulfilment of payment transactions as the payment can now be part of their customer's journey e.g., incorporating bill and invoice payments from their app. Another example is car dealerships that can use open banking APIs to allow their clients to instantly pay and drive away with the car in the same interaction rather than wait for the payment to clear until the next day.



5. Value-added services: Open banking data can be analysed to provide additional value-added services. For example, banks can help corporates avoid future cashflow problems by proactively comparing payment due dates for supplier invoices against current account balances to warn about potential lack of funds. They could also provide peer comparisons to companies on market share, utility spend and other aspects of running a business. **Barclays' SmartBusiness Dashboard** offers marketing effectiveness tools as part of a customizable business dashboard.



6. Beyond banking: Open banking data can lead to provision of services beyond banking. Expense management and scheduling supplier payments is an area where **UBS**, **Standard Chartered** and fintechs like **Bill.com** play. **Mastercard** is partnering with a fintech, **Cardlay**, to unlock corporate card data to provide automated expense management and VAT claim processes to their commercial clients. **Wells Fargo** together with **Quickbooks** (accounting software) provide automatic invoice issuance to SMEs. **RBS** and **Chase** are providing collections management services such as reminders and repayment solutions by analyzing debtor data. **Bank of America with Quickbooks** is providing payroll services to SMEs. Apart from banks, accounting and payroll processing companies can use HR and payroll data to flow freely across platforms and hence allow them to more efficiently manage HR, talent, time and attendance, payroll processing, payroll compliance and employee portals for their corporate clients. **Gusto** is an integrated platform that automates all payroll calculations, tax filings, reporting and payments to allow businesses to provide direct deposits to employees. Tax administration and inventory management are other areas where fintechs like **Davo**, **TradeGecko**, **Coconut** and **Holvi** have entered.

Temenos Infinity Virtual COO: A business intelligence growth engine to unlock small business growth, manage risk and drive engagement throughout the life of the small business enabling the bank to become the trusted partner.

Open Banking Data Aggregation

Aggregate multiple data sources (banking and non-banking) to provide a holistic view of 'business health' and deliver actionable insights in real-time for the business owners.

Actionable Insights

Create order and meaning from data to deliver a valuable diagnosis of business activities helping business owners to understand what's happened and why, and enabling the next-best-action.

Predictive Modeling

Engage the collective power of machine and industry intelligence to educate business owners on various options for addressing opportunities and prescribe a recommendation.

Simulation

Enable human-AI augmentation by allowing business owners to visualize alternate outcomes and perform 'what if' analysis of the AI models presented, empowering them to make informed choices for their business.

Eco-system Synergy

Enable industry collaboration opportunities for the SME community of your bank. Accelerate connectivity amongst the SME's themselves and professional service providers to encourage growth and tap into expertise. Using aggregated data, banks can provide education and data-driven industry benchmarking to SMEs to support and maximize SME success.

Automation

Allow Temenos Infinity VCOO to learn and automate the predictable, repetitive aspects of the operation, freeing business owners to spend time growing their business instead of running it.

Track & Trigger

Automate the monitoring of information and channels to identify and alert business owners to opportunities or risks for their timely attention, serving as a 'real-time business coach.'



Small business owners are very comfortable with whatever their business is. What they are less comfortable with is how to run a business. We tried to build a platform that acts like that COO they never had. It brings together information that business owners typically have to deal with, and we turned that into advice. The Temenos Infinity VCOO gives them that helping hand that is hard for a small business owner to find."

Jeff Wright

SVP Equipment, Digital & Client Solutions,
Canadian Western Bank

Embedded Finance and Banking-as-a-Service (BaaS)

As open banking morphs into open finance and open finance becomes integrated into digital ecosystems or platforms blurring industry boundaries, we come closer to an open data economy. Then, banking gets subsumed into cross-industry digital ecosystems through Banking-as-a-Service (BaaS) models. Built on the foundations of open banking frameworks, BaaS has come into its own since the COVID-19 pandemic. It is the provision of complete banking processes (deposits, loans, payments) as a service from specialist cloud-based API platforms that use a licensed bank's secure and regulated infrastructure to enable delivery of financial services at the point of customer need: **embedded finance**.

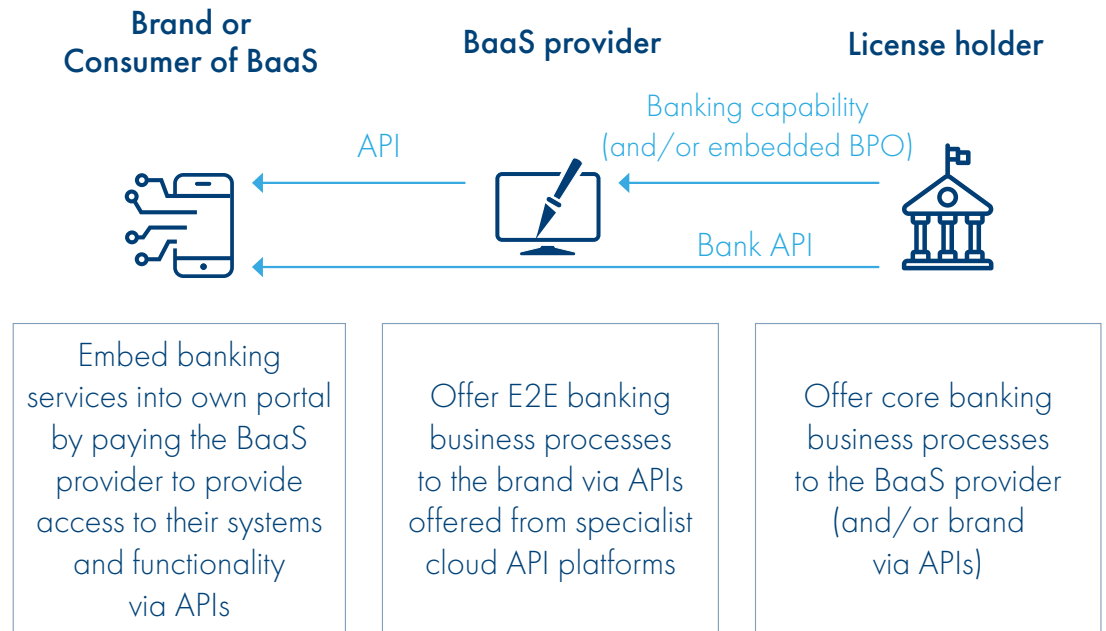
BaaS offers a radically different approach to financial services—one that deconstructs the old, traditional model and places its building blocks in the hands of a wider range of stakeholders. By doing so, it accelerates the democratisation of banking and its transformation into a platform economy. The end-customer benefits from the provision of banking and financial services into a personalized end-to-end customer journey designed to address their particular unmet need, delivered at the appropriate touchpoint with real-time, intelligent and contextual experiences. At the same time, they can be reassured that the service is provisioned ultimately from a licensed, regulated entity, protecting their financial and data assets.



BaaS differs from traditional white labelled banking service provision fundamentally because it is a technical and operating model driven by a loosely coupled plug & play API platform and operating model built on configurable components.

It offers stable BaaS revenue streams to the providers: pay-as-you-go in the test phase and then standard subscription-based as the brand scales and matures its services. The provider can also benefit from data sharing deals in lieu of or in addition to revenues to gain customer insights to personalize own offerings if applicable. Self service consumption implies low cost of sale compared to traditional bilateral partnerships involving RFPs, contracts and bespoke connectivity. BaaS players offer access to a sandbox and API documentation aimed at developers, build working apps at speed often offering the first transaction in a matter of hours and scaling operations in days.

BaaS Value Chain



BaaS = Business Process + Software

76%

of respondents say **more likely to use BaaS** as a route to market since **COVID-19**

92%

of respondents say BaaS is a **faster way to bring products to market** than building in-house

80%

of respondents say BaaS is a **way to extend reach into new geographic markets** than building in-house



1. The Brand or Consumer of BaaS is the company that owns the end-customer and wants to embed banking services seamlessly into its customer context and experience. Its primary aim is to build its own core differentiating digital and/or niche proposition at speed and scale without having to secure a banking license or invest in regulated banking infrastructure. It selects best-in-class capabilities from multiple BaaS providers in a plug-and-play on-demand model. Brands can be from virtually any sector though at present, the majority are fintechs or the platform giants. An example of a brand is **Singapore's Grab**, which began as a ride-hailing service similar to Uber which has embedded payment services into its app. These are sourced from the Dutch payment company **Adyen**, which holds a banking license and provides e-commerce, mobile and point-of-sale payments through an API-driven platform.



2. The BaaS provider is the company that provides one or more modular banking services through APIs to the customer-facing organizations. It typically partners with regulated banks. However, some BaaS providers hold licenses themselves and offer banking services to own client base. For these, BaaS offers the opportunity to diversify revenue streams even if cannibalizing own business and also enables them to use insights from BaaS to personalize own offerings. **Solarisbank**, one of the first BaaS providers offers over 180 Restful API endpoints that provide frictionless banking services as modules to non-banking enterprises, or even other banks.



3. The License holder rents its license to the BaaS provider and gives access to the underlying rails and compliant products. Some incumbent license holders offer own BaaS services directly to the brands as an add-on business line. BaaS partnerships help these players grow their balance sheets profitably as the brands have the ability to acquire new customers cheaply and rapidly through their differentiating propositions. BaaS provides them a means to collaborate rather than compete with new entrants (cannibalization offset by potential loss of market share). The Asia-focused UK bank **Standard Chartered** launched **nexus**, its new banking-as-a-service solution in March 2020 aimed at digital platforms and ecosystems like e-commerce, social media or ride-hailing companies to enable them to offer loans, credit cards and savings accounts co-created with the bank to their customers under their own brand name.

The rise of BaaS is hardly surprising given that open banking APIs are maturing across the globe and the platform economy with integrated experiences in demand. This has been enabled by the rapid adoption of disruptive technologies (Cloud/SaaS/ Microservices) in banking, all of which are prerequisites for this model. Finally, tough macroeconomic conditions exacerbated by the COVID-19 pandemic have constrained funding for the fintech brands and worsened profitability and margins for incumbent banks. The former cannot afford to build the banking infrastructure or obtain a license themselves; the latter are looking for new revenue streams. Therefore, the BaaS market is expected to grow significantly and reach \$3.6T by 2030⁴.

The BaaS Stack – Typical BaaS processes

Brand / BaaS Consumer	Embedded journeys				
	Buy, insure, service and run my car	Ecosystem of services (e.g. Apple)	House discovery and purchase	Start and run e-Commerce business (e.g. Shopify)	Start and run a small business (e.g., Square)
	Intelligent services				
	Holiday affordability	Building a savings pot	Paying bills when paid	Auto switch utilities	Plan for buying a home
	Financial products				
BaaS provider	Loans	Cards	Deposits	Payments	Securities
	Capabilities				
	KYC	Credit Scoring	Card Issuing	Identification & Authentication	Other Risk & Compliance
License holder	Transactional rails				
	Domestic / International payments	Card networks	Bond markets	Equity markets	Treasury
				General ledger	Regulatory reporting

Source: 11:FS; Temenos analysis

4. According to Bain Capital Ventures and 11:FS, assuming 40% of payments, 20% of lending and insurance volumes move from traditional banking to embedded finance by 2030



Buy Now Pay Later: Disrupting traditional consumer lenders

The concept of consumer credit and instalment loans has been revolutionized in the Banking-as-a-Service era by the “**Buy Now Pay Later (BNPL)**” offering that seamlessly embeds into the buying user experience. This is changing the economics of traditional lending from lending spreads taken from customers to earning commissions from merchants. The trend has arisen from the 20% boost to POS lending at the expense of physical cards since the COVID -19 pandemic. It appeals both to financially stressed and/or younger consumers who feel unfairly charged by credit card companies as well as to merchants as it helps them acquire new customers faster and cheaply, improve loyalty and increase average order value.

BNPL-related purchases are projected to grow 400% from \$24 billion in 2020 to \$100 billion in 2021. Leading BNPL players include **Klarna**, **Paypal** and, **Afterpay** while smaller players like **ChargeAfter**, **QuadPay**, **Uplift** and **Sezzle** are also doing extremely well. The acquisition of Afterpay by **Square** for a record \$29 billion endorses the success of the model. It also signals consolidation in the BNPL space or possible acquisition of these players by either incumbent banks or by large e-commerce retailers or platforms. BaaS partnerships around BNPL are also emerging. **Apple** has just announced the launch of a new service called Apple Pay Later in partnership with **Goldman Sachs** as the lender, that will let consumers pay for any Apple Pay purchase in instalments over time. This extends their relationship with Goldman Sachs who have provided the Apple Card credit card since 2019.



A leading payments provider launched its BNPL product on the Temenos lending platform, scaling to 22M accounts in just 9 months, the fastest and most successful product launch in the company's history. 70% of their customers say they love the product with 50% using it again. There has been a 15% uplift in merchant engagement as well.

Technology Implications of Open Banking and BaaS

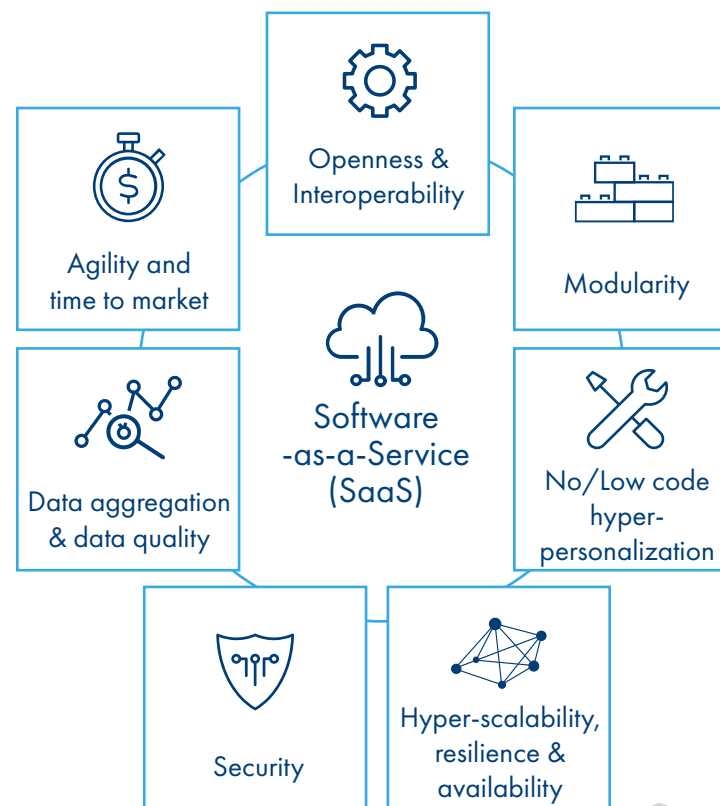


Open banking has been slow to take off, even in the most advanced markets like the UK and Europe. Banks' misgivings as well as consumer acceptance to share banking data and lack of interoperability of API standards across countries were cited as major factors. But above all, the constraints posed by legacy IT architectures at incumbent banks have impeded them from adopting open banking. A few months into the launch of open banking in the UK, a study on the performance of the Open Banking APIs revealed that several banks were failing to deliver adequate service quality levels to consumers for the basic APIs required by the Competition and Markets Authority. This included availability and latency broken down into DNS, handshake, connection, upload, download and processing times. The challenges of legacy infrastructures were noted in the report. Those that came bottom of the league were among the largest and best resourced banks in the UK.

Banks require a modern digital technology architecture to succeed in open banking. Those running functionally rich core banking systems built on distributed cloud-native IT architectures leveraging containers, microservices and open APIs are able to not only provide differentiating digital experiences for their own customers but are also able to establish open API marketplaces to exploit opportunities from open banking, whether to generate new revenue streams from own and 3rd party product innovation or from entering new markets or monetising APIs.

BaaS partnerships and direct provision takes these requirements to a whole new level for incumbents and new entrants alike. Innovative software providers in combination with public cloud infrastructure players provide just such a technology platform for the world of open banking and BaaS.

Characteristics of Technology to support Open Banking and BaaS





Openness and interoperability: Beyond the basic ability to consume external APIs and provide own APIs to 3rd parties as per regulatory and industry standards in the markets they operate in, banks and BaaS providers must be able to adapt their APIs rapidly to changing open banking and other regulatory requirements. Developer portals with advanced API documentation and ease of use as well as pre-integration to an eco-system of third-party technology providers is a prerequisite for open banking and BaaS.



Modularity: Open banking itself has specific use cases that must be supported stand alone. With the plug and play pay-as-you-go service model of BaaS, a microservices-based architecture that allows independently deployable services to be launched quickly becomes necessary.



No/Low code hyper-personalization: Open Banking and provision of BaaS are predicated on personalizing the banking services to meet the specific needs of the brand or embedded finance portal and allow them to differentiate their offerings. This requires software augmented with hyper-parameterization for maximum flexibility, with preconfigured, extensible and re-usable features as well as developer-friendly technical tooling.



Temenos was the only provider that was able to deliver on all three of our key requirements: **cloud, interoperability and open APIs**, with its world-class core banking system that will scale with us as we grow."

Minerva Tantoco
Co-Founder and CTO, Grasshopper Bank



What really differentiates Varo is our technology platform. We architected around **cloud and open APIs** and as we were evaluating a core banking provider it was really important to find a partner like Temenos who can support us. It's a highly scalable platform, it's a secure platform and it's a platform that the regulators were comfortable with."

Colin Walsh
Founder & CEO, Varo, US



Data aggregation & data quality:

High volumes of open banking data must be aggregated and analysed for the bank to develop personalized propositions or to provide insights to their ecosystem partners. The scalability of cloud platforms enables banks to collect, store, analyse and distribute this data in real-time such as to authenticate credit card transactions initiated through APIs.



Agility and time to market: For banks, open banking means rapidly and seamlessly connecting to third parties in digital eco-systems. For BaaS providers, agility in terms of scaling their APIs on demand in order to rapidly build new products for the brand or to help the brand expand into new geographies becomes key. Today's software packages come with thousands of configuration, migration and extension APIs and design-time tooling to allow banks and other providers of financial services to design and publish specific APIs, enabling rapid incremental implementation. The depth and breadth of available functionality localised for different markets is also a key advantage to rapidly meet the needs of diverse brands.



Hyperscalability, resilience and availability:

When banks open up for data access to third parties, the volume of queries on the customer and transactions data they own, increases severalfold. HSBC has met the surge in demand since they launched open banking in the UK and European markets with public cloud. Open banking also cements the need for banks to make systems available 24*7 and provide real-time access for the end-customers of third parties. Brands consuming BaaS require Industrial-strength resilience with zero risk of outages. Therefore, a scalable and resilient platform afforded by the public cloud infrastructure providers like Microsoft Azure and AWS becomes key.



Security: Arguably the most important requirement, open banking exposes customers' personal and financial data to increased risk of unauthorized access as a complex web of stakeholders now hold this data, albeit with their consent. In the UK, the implementation of Open Banking APIs has led to spikes in reported cyberattacks on financial services firms. Cybersecurity was also cited as the top investment focus area by respondents in a 2020 survey conducted by the Economist Intelligence Unit (EIU). Public cloud infrastructures and modern cloud-native software packages provide comprehensive security services – authentication, authorization, access and non-repudiation.



Software-as-a-service (SaaS) further enables banks and other providers of financial services to consume, manage and maintain packaged software in a secure, continually evolving, self-service platform while allowing them to develop their specific banking models through advanced configuration and extensibility capabilities at their own pace and desired frequency. For BaaS providers catering to the diverse needs of multiple brands, SaaS complements and supports the BaaS model of consumption.

Conclusion

At Temenos, we believe that the banking industry is moving inexorably towards open banking as it spreads across the world and proprietary data and proprietary relationships get relegated to the past. New digital ecosystems with embedded finance and banking-as-a-service are gaining traction driven by open APIs. Therefore, banks are having to re-think their business models in order to provide compelling new propositions to their customers in order to stay relevant and dominant in an industry served by a complex web of players. Their success in the world of open banking and BaaS is predicated on modern cloud-native and API-first technology – digital transformation becomes an imperative and not a choice to compete in this brave new world.



■ Author



Kanika Hope

Chief Strategy Officer

About Temenos

Temenos AG (SIX: TEMN) is the world's leader in banking software. Over 3,000 banks across the globe, including 41 of the top 50 banks, rely on Temenos to process both the daily transactions and client interactions of more than 500 million banking customers. Temenos offers cloud-native, cloud-agnostic and AI-driven front office, core banking, payments and fund administration software enabling banks to deliver frictionless, omnichannel customer experiences and gain operational excellence.

Temenos software is proven to enable its top-performing clients to achieve cost-income ratios of 26.8% half the industry average and returns on equity of 29%, three times the industry average. These clients also invest 51% of their IT budget on growth and innovation versus maintenance, which is double the industry average, proving the banks' IT investment is adding tangible value to their business.

For more information, please visit www.temenos.com.

©2021 Temenos Headquarters SA - all rights reserved. Warning: This document is protected by copyright law and international treaties. Unauthorised reproduction of this document, or any portion of it, may result in severe and criminal penalties, and will be prosecuted to the maximum extent possible under law