



Whitepaper

Understanding Banking as a Service: The Future of Banking

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Throughout history, banking has always played an important role — not only with regard to economic health but also in serving communities and helping them to thrive. In its earliest forms, banking was a slow process with varying levels of efficiency and adoption, however, with the advent of technology, changes in the industry were accelerated. Then, as technology became increasingly more sophisticated, the journey to digital banking began, and it continues today.

Today’s banking system is on a path of radical transformation. Significant changes include: changing business models and customer preferences, emergence of non-bank startups with disruptive technologies, and compliance pressure. Thinking progressively, some incumbents’ banks moved from a sole-provider model for financial solutions to emerge as marketplace of financial tools for customers to customize their own financial solutions. To come up with such a Banking as a Service (BaaS), or platform model, a tailor-made digital strategy is required to be successful.

At Persistent, with our extensive product engineering expertise and large banking customer base, we understand the challenges and developed frameworks — driven solutions to orchestrate the digital roadmap leading to BaaS. In this whitepaper, we will first explore multiple nuances of BaaS with some market research data and then explain the Persistent frameworks for the BaaS roadmap.

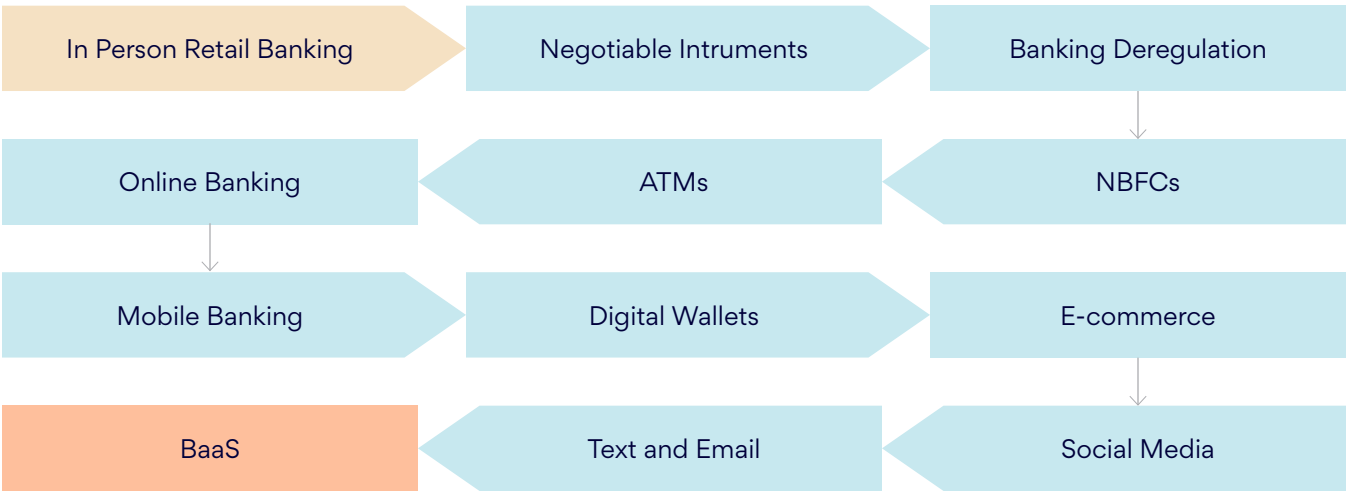


Figure 1 — Banking Journey

Definition

BaaS is the provision of a complete banking process (such as loans, payments) as a service using an existing licensed bank’s secure and regulated infrastructure with modern API-driven platforms.

Value Proposition of BaaS

- Monetization as per commercial agreement
- Understanding customer insight to find new segments and launch dedicated products
- Improve internal processes by consuming APIs
- Networking effect to multiply customer base
- Faster go-to-market with reduced cost of product and distribution

Value Chain of BaaS

- Licensed banks
- FinTech
- End user
- API providers
- Consumer platforms



Figure 2 — BaaS in Action

Key US and European Banks Evolving to be a BaaS

JPMC: 'JP Morgan Developer' is used as an investment arm and chase developer for its retail banking arm. The platform offers APIs in real-time payments, account balance, payment status track and trace, entitlements, wholesale banking, etc.

Citi: 'Citi - Developer Portal' instituted in 2016 with 3 API categories: Accounts, Identity Security and Payments.

Goldman Sachs: GS-Transaction bank API portal is leading BaaS. Their recent Oct 2020 release allows

non-financial clients to embed banking services to its own products.

HSBC: Portal spans more than 30 markets and 3 global businesses; it serves around 30,000 HSBC developers and thousands of external developers.

BBVA: Spain-headquartered BBVA became the first bank to launch BaaS in the US. Platform allows third parties to connect with core banking platform.

Key FinTechs Empowering the BaaS Journey

Stripe: Recently launched embedded finance solution. Partnered with banks like Goldman Sachs, City and Barclays. Stripe is further planning to use APIs to power Shopify, the bank account for merchants. Stripe has solutions in payment, payouts and business operations domain.

Marqueta: Recent major partnerships include Uber for global card-issuing partner and JP Morgan for commercial card business

Solaris Bank: Solaris bank offers a Banking-as-a-Service platform; through this platform, it offers bank accounts, KYC services, algorithmic scoring, and payment cards

Railsbank: London-headquartered, BaaS platform. Solutions include: credit cards; IBAN creation; direct debit; managing credit through APIs

Regulatory Framework for Open Banking and BaaS

Open banking and BaaS are sometimes used interchangeably but there is a fundamental difference between the two — open banking is giving access to data to a third party while BaaS is concerned with giving access to a brand for the functionality part as well. As far as regulatory framework is concerned

there is not much of regulatory development that has happened in the BaaS space; however, in open banking there are quite a few regulations available. There are different regulations present for different geographies.

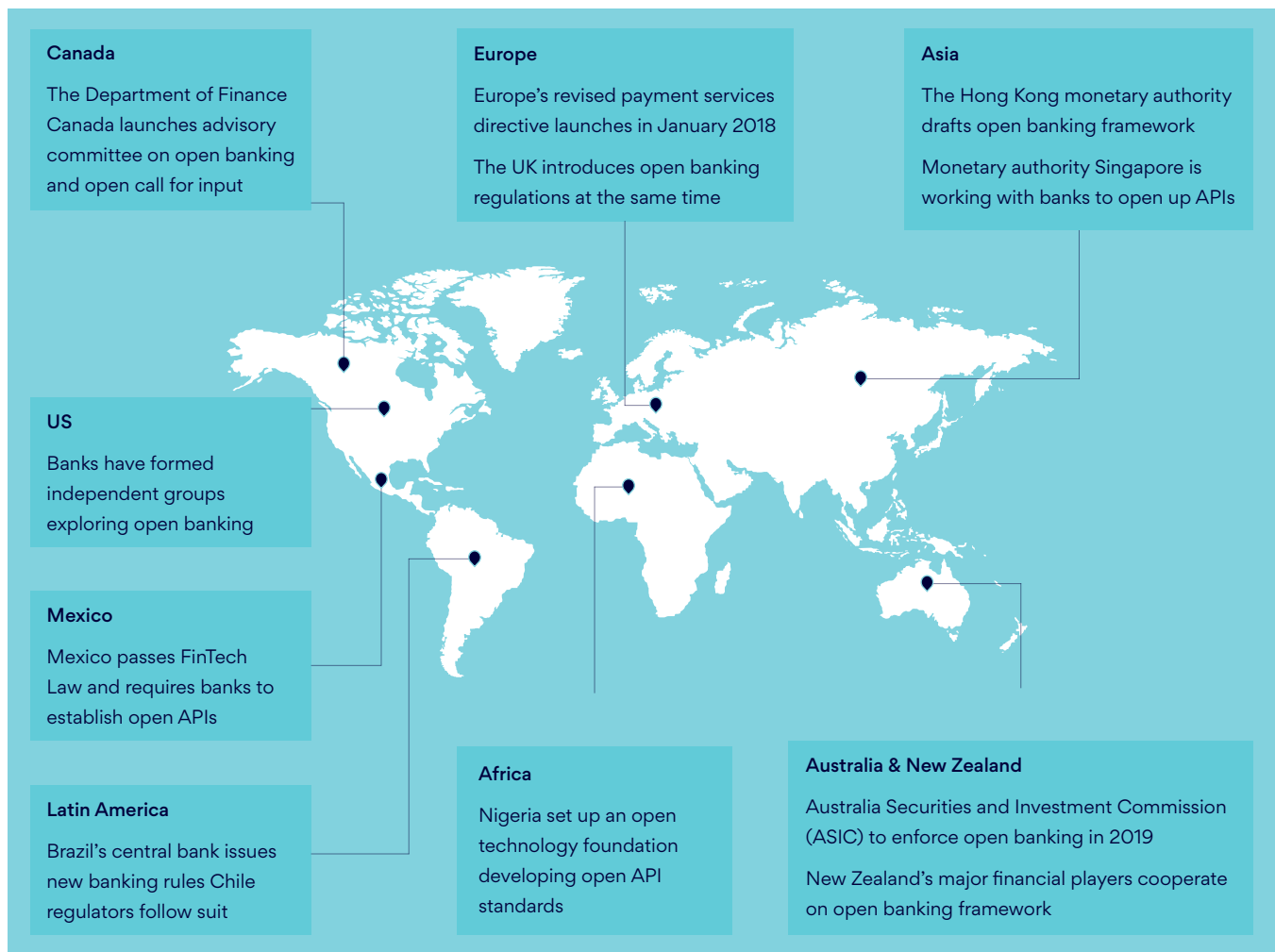


Figure 3 — Banking regulations and key drivers by region

US — Currently the US has not specifically released a law on BaaS or open banking but there is a study from the US Treasury Department regarding digital adoption in the banking ecosystem, specifically on payments, wealth management and loans. In the current ecosystem, state laws and regulations provide the primary regulatory framework. For lending and servicing, NBFCs require licenses for each state, wherever they are operating, similarly for payments and money transfers some sort of licensing requirements exist.

Treasury supports several specific regulatory approaches that would provide greater clarity and flexibility in the regulatory operating model for firms looking to provide financial services. Taken together, these approaches balance the key requirements for modernizing the regulatory operating model for U.S. firms. These approaches include:

- \\ State Harmonization
- \\ Bank Charters
- \\ Partnerships
- \\ Bank Innovation

UK

Open Banking Implementation Entity:

- Created by UK's competition and markets authority to create software standards and industry guidelines that drive competition and innovation in UK retail banking.
- Design specifications for API and support regulated third party providers and banks to use the open banking standards.
- Guidelines generation, process set up and manage open banking directory, and also create security and messaging standards.

Europe

PSD2 (Second Payment Service Directory)

- Is a part of European legislation which came into effect on 13th January 2018.
- Enables regulated third party providers to access customer bank account information and request payments.
- Purpose of this directive is to attract innovative tech firms to design more innovative solutions for customer service.

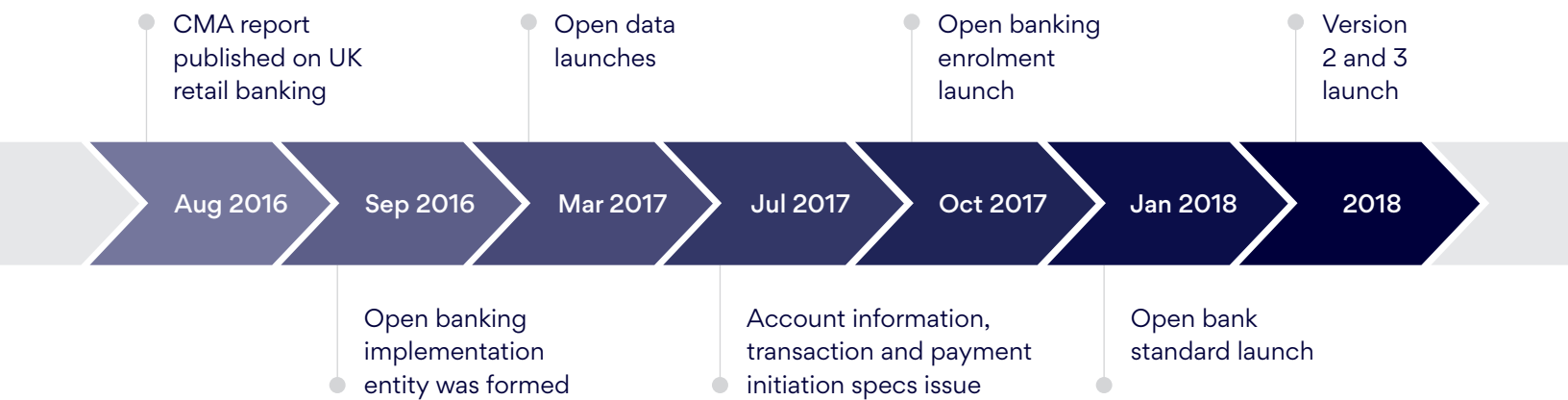


Figure 4 — Regulatory Laws in a Glance

Market Potential of BaaS

Non-Financial Big Tech Unicorns Utilizing BaaS

Uber — Uber money with digital cards, wallet and credit for contracted driver and couriers

Amazon — Pay later for zero interest credit and EMI option

Google — Maps to pay parking fees

Facebook — WhatsApp to offer QR codes and payments service with UPI

Increased Vertical Integration

Bring in value with third-party integration

Example — Digital identify, due diligence, cashflow forecasting, attention to business banking, account aggregation, ERP integration to account payable and receivable

Trends — API market size to be \$6.2B by 2024 with CAGR 28.4%. More details at [Link](#)

Embedded Finance


Non-fintech sectors such as HR, real estate, hospitals, healthcare and hospitality sectors

Example — Loan repayments on the company intranet, bundling insurance with travel, payments in property management


Trends — By 2030 global opportunity size ~\$3.6T with 40% payment, 20% lending and 20% insurance volume moves to embedded solutions


Big Tech entering into Finance

 +  → Apple cards

 → Launched its working capital arm stripe-capital

 → \$5B loans by 2020

 → Clearing the legal battle of cryptocurrency Libra

 → Amazon ready to use API already in use by various financial firms

Global Platforms

Expansion of regional platform into Global

Example — Catering financial services of native population to foreign Countries, new entrants to enter and be absorbed by the incumbents

Trends — BaaS market to grow over \$1T at CAGR 6% whereas in India, fintechs are growing at CAGR 22.7% for global supply [Link](#)

Financial Inclusion

Simplified services with increased accessibility and affordability

Example — Micro loans and insurance act as intermediaries for commodity demand and supply ecosystem

Trends — Micro finance industry in India is growing at CAGR 27% with 2019 disbursement of ~\$10B. More details at [Link](#)

Different BaaS Business Models

Engagement Models

API Store	Traditional or challenger banks that are direct-to-consumer but also offer their products and services as APIs to third-party players
White Label Platform (B2B2C)	With/without banking license offer banking platform to fintechs and manage compliance, ledger maintenance
Co-Branding	BaaS platform along with the customer experience and cutting-edge capabilities that it carries, effectively becomes a distribution and onboarding channel for the traditional bank

Monetization Models

Revenue sharing agreements	One-time setup charges	Periodic recurring fees	Pay as you go
Subscription models per Ac/ transaction commission	Interchange split	Deposits received	Combination of the above

Proposition Models

Value to Customer

Aggregation	Single view of customer financials
	Wealth management platform
	Line of credit dashboards
	Credit scoring
Process improvement	Identify verification and KYC
	International remittance service
	Dynamic payroll
	Loyalty programmers
Advice and analysis tools	Money management
	Market place
Enhanced banking product offerings	Bespoke lending
	Overdraft decoupling
	Micro savings and deposits
	Cash flow management
Enhanced non-banking product offerings	Utility management
	Accounting and Tax service
	Property management

Functional Capabilities of an Ideal BaaS

BaaS can be categorized at different functional layers in terms of offered features. License holder banks can have the core functionalities intact and provide APIs for a specific feature as an API for doing KYC or credit scoring. On the other hand, banks can provide account opening API to a service provider for developing their own products on top of that. A symbolic representation of key layers and associated features are given below. As per the

business opportunity and financial ecosystem, banks can evaluate at what layer they want to open their APIs and accordingly different customer engagement models can be selected. Functional capability definition and drill down will lead into the technical capability identification for enablement of the business features; this will be appended by the core IT and non-functional requirements of the platform.

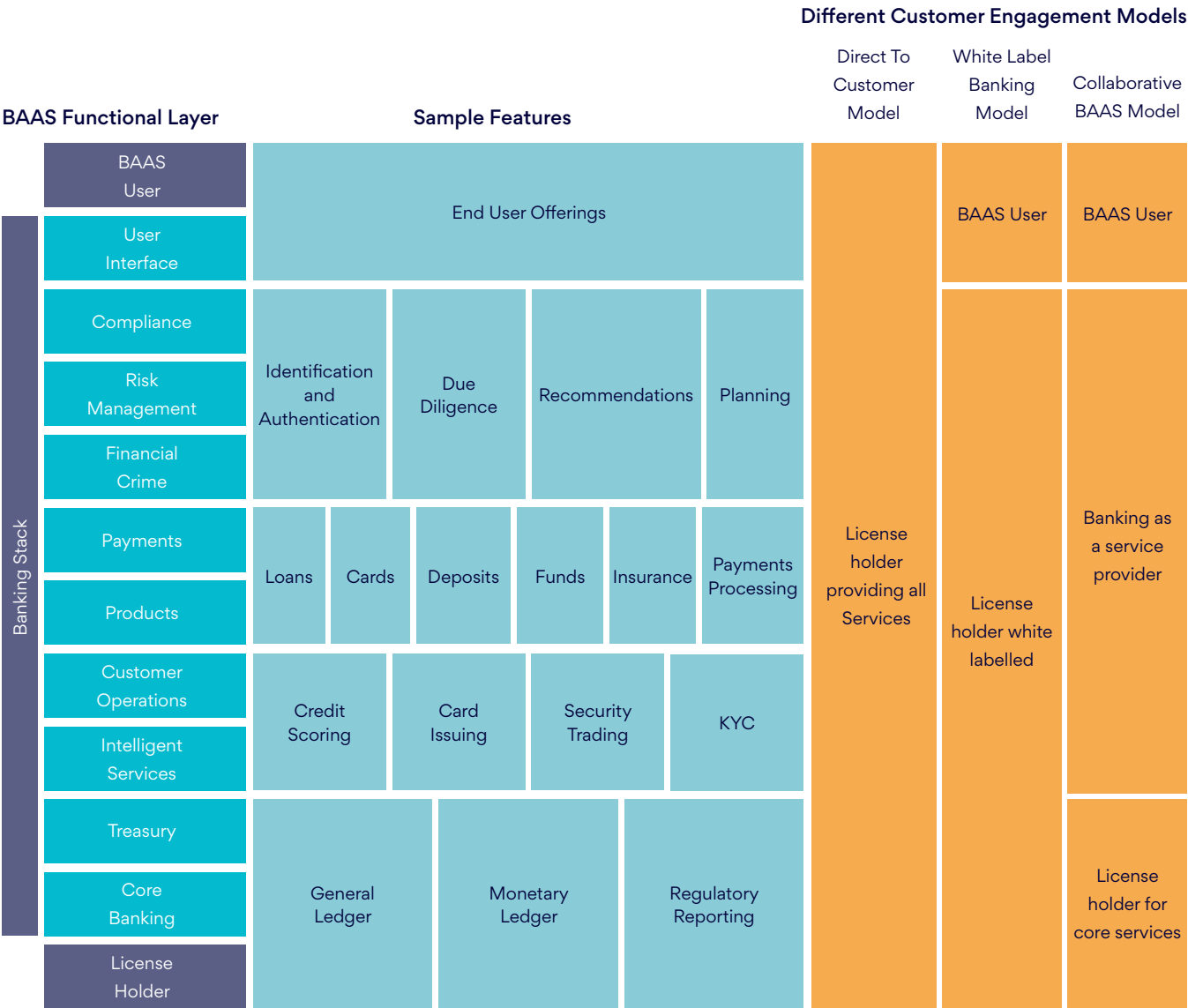


Figure 5 — BaaS Functional View

Technical Capabilities — An Ideal BaaS

To determine technical capabilities of an ideal BaaS platform requires a detailed assessment to define the core platform features, instituting secured operations

and alignment to regulatory compliance covering the risk and legal areas. Key assessment areas are shown below:

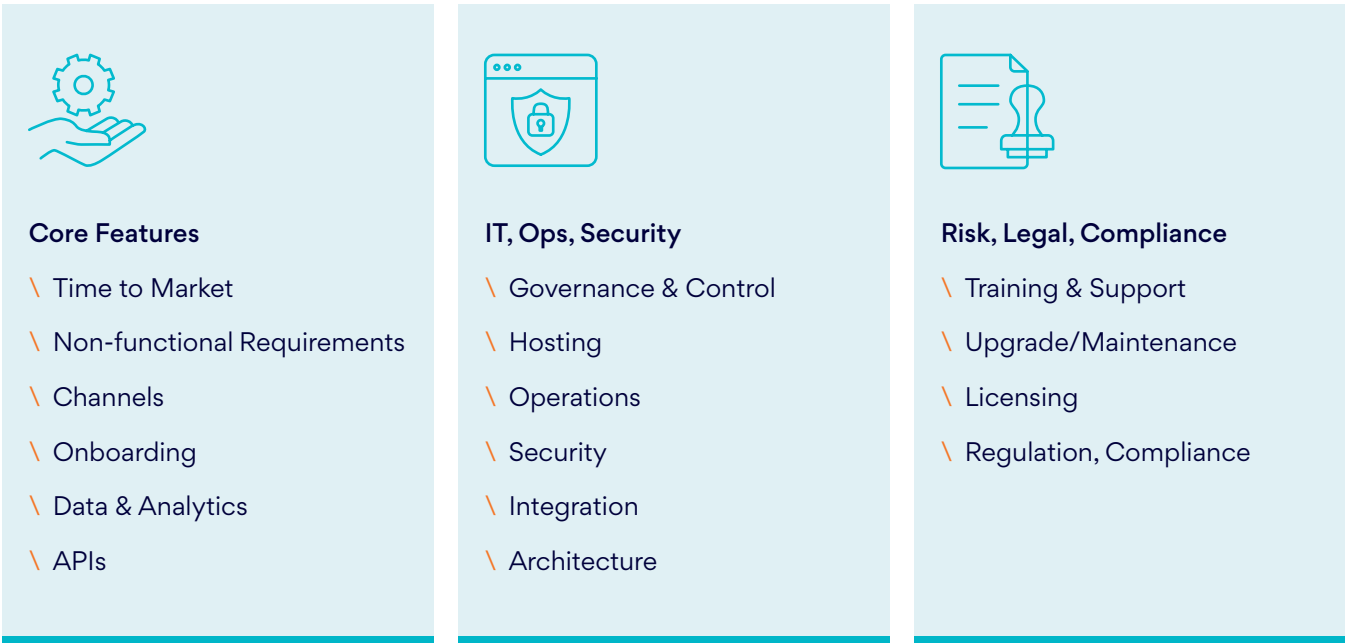


Figure 6 — BaaS Technical Assessment Areas

Platform capabilities definition will lead into assessment and analysis of the current state of systems capabilities to support BaaS and performing a gap analysis from the target state.

Persistent's Approach to Achieve BaaS

BaaS journey starts with evaluation of current state and readiness for BaaS by identifying area of strengths, market presence and strategies for BaaS adoption on different parameters as:

Parameters to Evaluate	For Customers	For Business
Market presence and target customer segment	Behavior trends on existing customers	How completion is moving
In-house legacy products and services offered through traditional channels	Customer adoption to digital offerings and new age FinTech products penetration	Legacy modernization roadmap
Current market leading capabilities and technology initiatives	Customer touch points and context sensitive data for new offerings	Roadmap of new propositions
Niche areas of offerings, unique products	Customer adoption to new offerings	Cost benefits analysis for opening up APIs
Possible ecosystem of providers to collaborate and increase market share or entering into new segment	Value proposition of extended services	Revenue models and long-term goals

After understanding core competencies, the next stage is to follow it up with a technical maturity assessment for BaaS readiness:

API Landscape	Core Banking System	Cloud Readiness	Security and Resiliency
Do we have a fully functional microservice architecture or tactical API gateway built on technical stack?	State of the core banking system — Is it a fragmented or single monolithic application?	Assess the software and organization characteristics to estimate PaaS migration.	Measure the robustness and security aspects of current systems against production failure and threats.

Identification of the current BaaS maturity is critical to define the approach for achieving the end target state. At a high level, we can define three different maturity

stages beginning with legacy modernization as the base foundation. Achievement of a maturity level will lead into a higher maturity level.

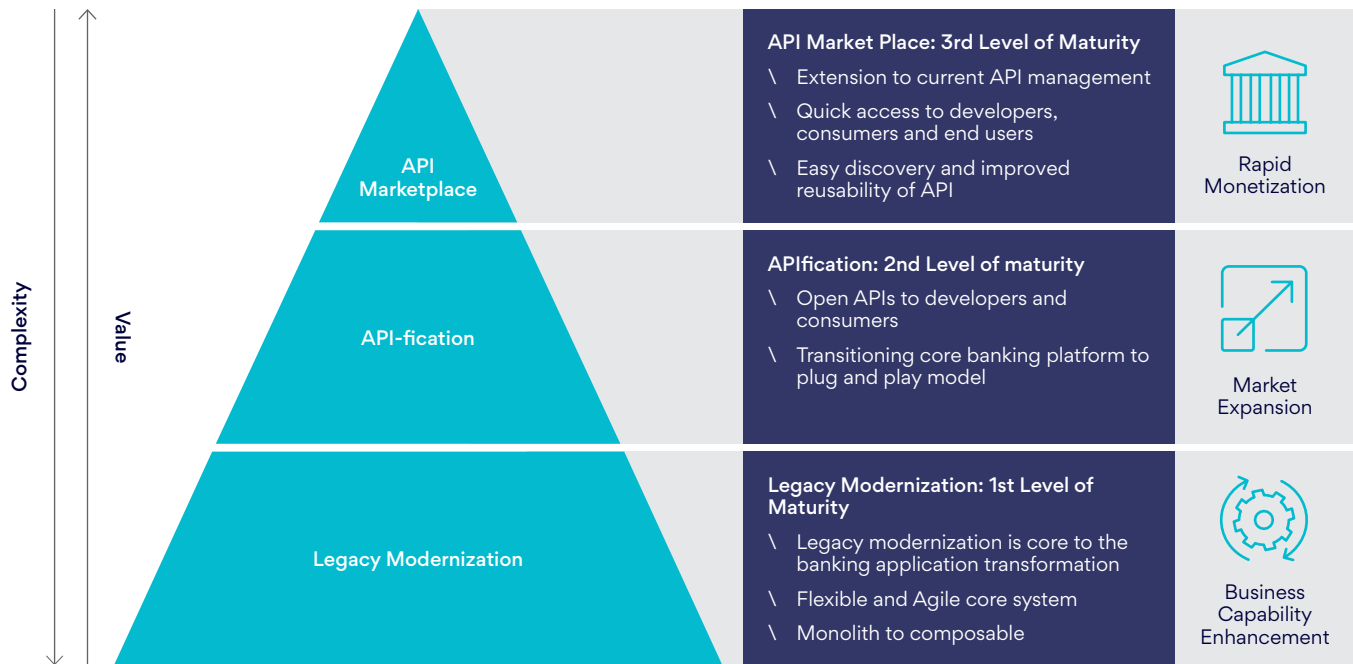


Figure 7 — BaaS Maturity and Hierarchy Model

Maturity assessment and gap analysis will derive action items to fulfill the BaaS platform requirements.

The Persistent approach to BaaS platform implementation is outlined to help customers navigate this shift:

- BaaS systems and platforms modernization implies loosely-coupled apps exposed as business services, which is the backbone of BaaS
- Next maturity model is the API-fication that is exposing the services as APIs for consumption promoting reuse, standardized contracts, less change and faster time to market. These APIs need to be supported by a developer portal, API management and gateway platform.
- Once API store maturity has been achieved, next level is to have an API marketplace ecosystem that will promote further innovation, collaboration within and outside the bank and get more API providers and consumers to use the platform and create innovative products. Along with the API store, community forums, evangelism, hackathons, documentation, and FAQs, frequent communication also needs to be instituted for promoting the marketplace.
- For a robust BaaS strategy, it is imperative to have strong and foundational engineering processes, and tools and governance with which the journey will happen. This will start with an API first approach.
- At the end, core part of this change is about how we deliver products to the market faster, with quality and scale via APIs; this involves both technology, business and process changes; for which a clear organizational change management framework is needed at outset and evolve over time. This will be supported by Agile and DevOps practices for a cost effective and faster time to market.



Figure 8 – Persistent BaaS Enablement Framework



It is evident that the BaaS scope and expansion will keep on growing as new business models evolve. To leapfrog the competition, long term as well as short term strategies to be planned aligned to specific business goals. COVID has led the focus shifted to cost optimization, stifling growth in some traditional product areas, prompting a new wave of innovation,

recasting the role of branches, and of course, accelerating digitization in almost every sphere of banking and capital markets. However, the growth of embedded finance will quickly shift the focus to BaaS expansion and robust digital robust with an incumbent partner is the road ahead.

Appendix

Latest Merger and Acquisition in BaaS:

M&A – 2020	
 ↓ 	To embed wider financial products in BaaS
 ↓ 	To work more closely with FinTechs and their customers
 ↓ 	Expand offerings with credit decisioning experts
 ↓ 	Entering into B2B space of white labelled financial services
 ↓ 	Expand digital footprint within the organizational processes

Partnership – 2020	
 PENTA	Non-banking license holder using APIs from other bank
 dozens	Payments API provider extending the services to investment bank
 Alipay	Enabling banks to provide services in foreign country
 modul8	Card issuing and payment service to others in collaboration
 Statrys	Enabling local currency accounts in foreign countries
 BharatPe	Payment firm offering small loans

Key Players:

Upcoming Challenger Banks and FinTech — 2020

STASH	Investing, banking, saving & education at one platform for middle class US
Revolut	Lower exchange fees for travelers
deserve	Credit products for students, GenNext and millennials
Varo	Low-cost micro savings products to build financial health
MoneyLion	Financial guidance to improve credit score improvements
upgrade	Low-cost credit products
Aspiration	Banking/investing tied to social causes
TANDEM	Sharing the fees and charges with customer and social causes

Top Global Banks Expanding on BaaS

US & South America	WELLS FARGO	citibank	cross river	RADIUS BANK	J.P.Morgan
	Goldman Sachs	Capital One	CBW BANK	BANCO DO BRASIL	Itaú
Europe	BARCLAYS	BBVA	Santander	Nordea	
	NatWest Group	Deutsche Bank	ING	ABN-AMRO	
Africa	EQUITY	absa	NEDBANK		
Asia	HSBC	ICICI Bank	SBM bank	WeBank 微众银行	
	IDFC FIRST Bank	Commonwealth Bank	Emirates NBD	DBS BANK	
	Standard Chartered	National Australia Bank	FEDERAL BANK		

Competitive View

Leading US Banks

J.P.Morgan

- \ JP Morgan Developer is used as an investment arm and a chase developer for the retail banking arm.
- \ The platform offers APIs in real time payments, account balance, payment status track and trace, entitlements, wholesale banking, etc.
- \ They have partnered with FinTechs like Kyriba, GTreasury, Salmon Software, Tresura, SAP realtime treasury and Trovata to offer solutions in treasury management and enterprise resource planning.

WELLS FARGO

- \ Through the developer gateway they currently offer 14 public API products, 7 each for payments the data services category.
- \ They have partnered with financial aggregator Finicity, accounting software provider Xero, and Intuit.

citibank

- \ Citi opened the developer portal in 2016. They also have an entire branch called Citi Fintech that is using APIs externally and internally.
- \ They have APIs in 3 categories:
 - Accounts
 - Identity
 - Security and Payments
- \ Accounts has 3 APIs while Identity and Security and Payments have one each.
- In 2019 they partnered with Cachematrix, a Software-as-a-Service fintech firm that launched a refreshed digital investment portal.

Goldman Sachs

- \ GS released BaaS software in Oct '20 which allows clients to embed banking services to its own products.
- \ GS opened transaction bank APIs to the developers through TxB API portal.
- \ By connecting directly into this corporate platform, clients can open accounts quickly and take advantage of the bank's automated payments programs; Goldman's developer site has three main APIs:
 - GSQuant
 - PlotTool Pro
 - Marquee API Developer

Leading European Banks



- HSBC developed APIs in cards, mortgage and payments and partnered with developers for innovative solutions.
- HSBC's team used internal APIs, such as the accounts API and transactions API, to develop the Nudge app.
- Portal spans more than 30 markets and 3 global businesses; it serves around 30,000 HSBC developers and thousands of external developers.



- The developer portal has been online since March 2009.
- They have APIs in cash management (eg. payment initiation, account information, PSD2 automatic registration services, global banking and global markets).



- Launched BaaS platform Nexus in March 2020.
- Standard Chartered started off with a major e-commerce platform in Indonesia as their first partner and expect to co-create and launch products powered by Nexus in 2021.
- The "Banking as a Service" solution was incubated at SC ventures, Standard Chartered innovation, FinTech investment and ventures arm.



- Spain-headquartered BBVA became the first bank to launch BaaS in the US.
- Platform allows third parties to connect with core the banking platform.
- APIs include payments, identity verification, card issuance, etc.
- BBVA open platform is managed as separate business.



US-based payment company with an approx. 36 billion valuation (April 2020)	Approx. 4.3 billion valuation backed by Goldman Sachs and Visa	SoFi recently acquired banking and payments platform for 1.2 billion	Partnership between Q2, a provider of cloud-based digital banking solutions, and StoneCastle
<ul style="list-style-type: none"> Recently launched embedded finance solution. Partnered with banks like Goldman Sachs, City and Barclays. Stripe will be using the API to power Shopify balance, the bank account for merchants which the Shopify platform is planning to launch. Stripe has solutions in payment, payouts and business operations domain. 	<ul style="list-style-type: none"> Recent major partnerships include Uber for global card-issuing partner and JP Morgan for commercial card business. Major markets include United States, Canada, Europe, and Australia. Certified to process payments in 10 countries in APAC. 	<ul style="list-style-type: none"> Galileo offers payment solutions. Some big partners include Digital bank chime, Money transfer service TransferWise and Stock trading app Robinhood. In 2019, global transaction volume doubled from approx. 26 billion to nearly 45 billion in just 6 months. All top 5 FinTech firms of UK are customers. 	<ul style="list-style-type: none"> Major offerings include the underlying infrastructure that's needed to launch basic and advanced banking services. Does not work as a plug and play solution. StoneCastle's distributed deposit network and Q2's CorePro solution give a unique competitive edge to Cambr.

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About Persistent

With 12,000+ employees around the world, Persistent Systems (BSE & NSE: PERSISTENT) is a global solutions leader delivering digital business acceleration, enterprise modernization, and next-generation product engineering across industries and geographies. Through a digital mosaic of disruptive technologies and partnerships with leading platform providers, Persistent helps traditional banking institutions and fintechs strive for growth.

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