



Banking APIs: State of the Market Report 2018

The New Banking Stack

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About the authors



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Mehdi has evangelized APIs since 2011, and strongly believes APIs define a new supply chain: on the business, the technical, and the legal side of the web.

Mehdi is a regular speaker and industry influencer at many API and developer conferences, where he is known for sharing his point of view on the industry and where the API economy is going, always with opinionated ideas that help drive the debate forward.



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Mark Boyd is a writer and API industry analyst. He writes regularly about the growth of the API economy for ProgrammableWeb, The New Stack, and has chaired several API conferences. He has published a number of ebooks on the API lifecycle, container technologies, serverless, GraphQL, and best practices for API adoption.

Mark also regularly conducts industry research and manages data-driven projects that draw on open data and proprietary sources.

With a public health and urban planning background, Mark is especially interested in how APIs can enhance citizen and local business engagement and help local governments transform into a city-as-a-platform model.



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Executive Summary

Amongst many banks, legacy infrastructure is about halfway through a modernization process, lines of business are coming on board, but there is still lack of a strategy that leverages APIs to create the financial ecosystems of the future. Returning to a focus on strategy, and on working with fintech through a niche, or microservices, approach may provide a way forward.

The *Banking APIs: State of the Market* reports have been published for the past four years. With growing realization across all industries that APIs were enabling faster product development, easier partner onboarding, more efficient internal processes, and the development of ecosystems, banks like other industries began to take note. In addition, emerging regulations like the European Second Payments Services Directive (PSD2) made it a necessity for banks to consider how to add APIs to their stack.

In the four years since our first report, several waves of change have occurred. Initially, banking APIs were a technical consideration, then they became a regulatory requirement. Now, they are finally being recognized as a business opportunity.

This year's survey with fintech and banking staff, and our interviews with banking executives, are showing that the open banking market is still at the very start of its implementation. Many banks are still halfway through technical reorientation and legacy modernization programs. In these banks, APIs are being created to replace SOAP and point-to-point internal services by teams that are predominantly made up of engineering staff. With new REST APIs being put in place, banks move towards instituting a range of internal governance processes, which were often lacking just one year ago. As these internal governance processes — including standards, style guides, automated CI/CD workflows, and governance and architecture committees — are introduced, banks are then requiring business units to lead any new API creation.

It is at this stage that the banks move their mindset from seeing APIs as a technical issue to being ready to consider an ecosystem play. But amongst the banks we spoke with, some API leadership teams are still advocating for the potential of APIs, while others are experimenting with building new products. Discussions around new business models and what banks want from an ecosystem approach are in the very early stages.

Meanwhile, the biggest threats to banks are still the fintech startups and tech giants. Fintech startups are quickly building new customer-facing products, and are now beginning to collaborate with other fintech and challenger banks so that they can offer a broader suite of services. Meanwhile, tech giants like Amazon have payments infrastructure in place and are able to offer loans as well as payments functionality.

Regulations are emerging in many jurisdictions following Europe's lead. This will place additional pressure on banks to adopt open APIs, whether they see the business advantage or not. Already, PSD2 regulations have forced several banks in Europe that feel they have strong customer relationships and the ability to build new mobile experiences that continue meeting customer expectations, to recognize that APIs will bring a new type of competition to their market. They are recognizing they need to position themselves as the ecosystem hub in order not to lose their core customer base.

One approach banks can take is to have a Strategy-with-APIs first approach and to create APIs using a RISK model that fosters an ecosystem model to make open banking a successful manoeuvre.

Strategy-with-APIs: Banks need to look at their wider business goals and the overarching market of regulation, fintech, and tech giants and ask: how can APIs help us achieve our business goals?

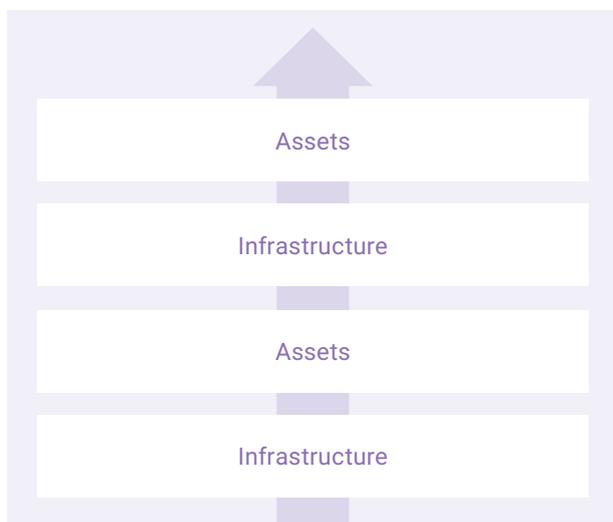
RISK: Banks can then focus on one niche (or microsegment) at a time to build out experiential APIs that can be shared with fintech third party providers. Banks can Rally, Invest, Steal or Kill fintech in these new ecosystems in order to build the open banking platforms of the future.

The pieces are now all falling into place: banks have the technical capabilities, they already have the customer base, and the regulatory environments are supporting them to leverage APIs effectively. The next two years will see if banks are ready for this new challenge.

The RISK Strategy and the New Banking Stack

In this strategy note by *Banking APIs: State of the Market* co-author, Mehdi Medjaoui, we look back at how successful platforms have been built and discuss the technical and strategic implications for banks wanting to successfully create an open banking platform.

Over the past ten years, startups have entered established markets and gained traction by moving quickly from being a cool app that does one thing, to becoming fully fledged platforms that are able to gobble up the whole vertical industry stream from customer experience to apps, from distribution to products, from products to platforms, and from assets to infrastructure, distribution to products, and from apps to customers. This strategy is now being seen in financial and banking services to some extent.



Over the past decade, thanks to internal APIs and more agile, modern software design, startups have been at an advantage in some industries as they have been able to focus their energies on the user experience. They built their customer base by iterating quickly and often. They made assumptions about what customers wanted, tested those assumptions, and once they figured out what their market wanted, they were able to move quickly to provide it. Startups leveraged lean methodologies to gain traction and demonstrate their market value. Investment dollars then followed.

The whole strategy was focused on filling the gap between the inability to deliver great digital products and creating the customer experience people want in a digital era. This is where startups belong, and where they can spread out in a *blue ocean strategy*.

This pattern is now playing out in traditional financial and banking sectors, and it consists of four steps:

- 1 A focus on customer experience and gaining traction
- 2 Developing or integrating fast products
- 3 Developing their own assets, data, algorithms and ability to monetize their customer base
- 4 Developing their own technical, business and licensing infrastructure to build a full stack on the value chain.

TransferWise is a good example of building this traction in the international payments transfer space. Venmo and Cashapp are leading examples for peer to peer payment transfers in the U.S. WePay did it for B2B and platform payments. Funding Circle for small business lending. NerdWallet, Mint and Yodlee for account information. They all filled a gap in a market dominated by the fact that banks thought they were the only one being able to deliver financial services.

With the democratization of software, the ability to put people in networks more easily and with venture capital funding, these fintech startups have been able to develop financial services in niches that were put aside by big banks, because banks saw them as too small to customize applications or offer to invest in them. These startups will focus on the best customer experience application to win customers from existing banks, because the bank's apps "suck" in terms of experience. And it's cheaper for the startups to do that, as they don't need to develop their own bank infrastructure or ask for a new licence, they just need to use the bank APIs or scrape the website and they are able to exploit a bank's infrastructure at no cost. The only difference is that the user is attracted by the startup's app, not the bank's app.

The startup gets hundreds of thousands of users that the bank had spent millions of dollars to acquire, all for the cost of an mobile app. This is the first step outlined above.

Once startups build out their customer-experience app and get traction, they become suppliers, with a certain degree of market power. They can now partner with startups servicing other parts of the financial services value chain. In the U.S., collaborations between Funding Circle and NerdWallet have meant that together the fintech startups are able to offer a more fully rounded suite of small business banking products to their customers. This is step two of the disruption pattern.

Banks often felt “disrupted” by these emerging players. Banks are large enterprises, like huge tankers that can’t change course as rapidly as startup speedboats. They have to take their full vertical stack with them when implementing changes: that infrastructure, those assets, the distribution channels and legacy content all weighed them down when making any change to add a feature, partner with a new player, or reposition themselves. It took a ton of minor changes at each level of the banking vertical, which slowed them down against nimble startups that were focusing solely on customer experience and releasing new features every 2, 3 or 4 weeks.

As they have a current infrastructure, assets and distribution networks, banks have the burden of their organizational and technological legacy anytime they want to innovate in the customer experience field. Banks can’t be a digital player against startups if their product iterations are every 9-12 months.

Four years ago, when first publishing the *Banking APIs: State of the Market* reports, we noted that banks were in a process of reorienting their architecture towards microservices and APIs. While some leaders have completed that work, the survey results and interviews conducted this year suggest that the majority are still only halfway through that process.

Meanwhile, startups that built themselves up quickly as one app codebase and started to hit growth trajectories, have faced similar problems with managing legacy as the large enterprises. Looking at how some of the challenger banks are releasing APIs — with one API to do payments and transactions, for example — we wonder if they will face similar issues down the track with an unwieldy do-everything API that cannot be monetized by separate capabilities and that creates

headaches for version control, and for adding new features.

But other fintech startups have been savvy enough to think about that from the start, or at least early on, and have leveraged APIs as their building blocks to create products and services. This future-proofed them as they scaled up and out. WePay did so to such an extent that they were bought by JP Morgan Chase as a complete API payments product that could then be integrated into the bank’s infrastructure. Others like TransferWise were able to create new partnerships. Originally, they had joined with Challenger Bank N26, but that arrangement now appears to be on hold, according to TechCrunch, and instead TransferWise has been able to sign partnership agreements with leading banks like the French group BPCE.

The UK’s TrueLayer seems to be taking this stepwise approach by building a data API for transactions, identity and account information first, and then moving onto a payments API in their roadmap. They are also focusing on the UK market first before then moving on to Europe.

LUXHUB started in Luxembourg as a fintech spun out of a partnership amongst that nation’s major banks. LUXHUB is now building out PSD2-compliant APIs as well as compliance-as-a-service features so that other banks do not need to manage the regulatory requirements of confirming and auditing third party providers. While LUXHUB was originally started for Luxembourg banks, they have ambitions to become a European-wide PSD2-compliant marketplace for open banking.

This is how these startups are now becoming sector-wide platforms: by either teaming up with other fintech startups to extend their financial services product range, or by partnering with (or being acquired by) banks who need their product development speed and customer engagement skills as much as they need their readymade API infrastructure.

Banks have a lot of muscle they can use to ward off any potential fintech disruptors. They may not have the agility to be solely customer-experience focused and test new engagement as iteratively as startups, but they have a wealth of industry knowledge; plus they own whole tracks of the vertical pipeline from infrastructure, assets, distribution systems, content, and products. They also have an existing customer base that they can engage with to maintain their market position. This is definitely the case in some jurisdictions like in the Scandinavian countries, where mobile banking usage is highly regarded and banks still have the customer engagement capacities to keep customers loyal. In other jurisdictions, banks are losing out to tech behemoths like Amazon who are not only widening their range of financial services (particularly across payments and lending), but are also able to stay laser focused on quality experience in order to keep the trust of their customers.

In 2018, the question is not so much will banks use their industry strength and resources to fight the startup

disruptors of their sector. The question is: will they know how to use their strength?

This year's research indicates that in order to avoid competing against fintech alliances and the tech giants, banks need to do two things:

- 1 Adopt a Strategy-with-APIs approach, and
- 2 Consider a RISK strategy.

1. Strategy-with-APIs and API-first business

The key word in Strategy-with-APIs is Strategy. This isn't about putting APIs first, it's about putting strategy first, and using APIs to implement it. It's a subtle but important difference, for two reasons.

First, "API First" business and architectural approaches haven't truly worked. Banks have been led to the API agenda for two main reasons. Globally, the need to create mobile applications and speed up product development has meant that APIs have been seen as a useful, reusable software development design approach that can speed up future feature and product development. Several banks recognized this and began trying to modernize their architecture to make use of APIs. Simultaneously in Europe, the Second Payment Services Directive began to be ushered in, requiring banks to make payments and account information available in a frictionless way to more accredited third party providers. Banks have taken up these challenges by reorienting their legacy architecture towards APIs and microservices. Often this has been done by IT and technical teams, who have then had to try and explain the business benefits of doing so.

Taking an "API First" approach has helped many banks build APIs. But banks in this position still need to take a product-based approach if they want to see their APIs gain traction and to ensure the value they have baked into their API will materialize. So far, for banks, API First in itself hadn't worked.

The second key reason "API First" business approaches didn't work is because building APIs first leads to then thinking about what business models will suit those APIs. Pricing models for APIs have not been tested, and there can be a disconnect here around expectations for new revenue for the APIs being introduced. Instead, the focus should be for an enterprise to look at its business model, and see what are the best APIs to realize that vision. Then the pricing models will come that match those goals. API industry leader John Musser makes this point when he talks about what key performance indicators are necessary for APIs: "To measure the impact of APIs, you first need to understand what business goal they are trying to achieve and then you can measure if the APIs are helping you get there," he says.

A Strategy-with-APIs is about putting value first. APIs and microservices become essential components in generating value. They are a way to create the

infrastructure that will foster an ecosystem. That means an internal ecosystem first, where business units and partners can use organizational assets to speed up automated processes and internal product development, and then an external ecosystem so that third parties can help a business enter new markets or appeal to existing customers in new ways.

This year's research suggests that many banks are somewhere between these two approaches. API First may have been the initial impetus for modernizing architecture or for reasons of meeting regulation. But now that those technological reorientations are underway, IT teams are increasingly seeing the need to get line of business buy-in for owning the APIs and treating them as products that can help achieve wider business goals. That education process varies from bank to bank: some have advocated successfully internally and have lines of business identifying use cases and owning the API creation process. Other banks are still setting up internal governance processes so that APIs are created in a standardized manner and have the potential to be shared first internally, and then monetized with partners or third party developers.

However, there are some changes emerging. One banking executive's comment summarized similar experiences from a number of interviews:

"We invested a lot to get the API mindset in the company. On the tech level, it is well understood, and the line of business has a vision of what they want to achieve and from that we discuss whether an API is the right strategy. Now we are seeing the business side being ready to expose an API to the outside world. You see more and more that it is growing in understanding across the bank."

Implementing a Strategy-with-APIs still requires a focus on reorienting the IT architecture, and for most banks that work is currently being done. But now the focus needs to be about setting up a layered structure that will enable the business strategy to be executed effectively.

The Crucial Role of API Management

Any bank that is looking at a platform play or plans on seeding an ecosystem will need an API management solution in place. API management provides the core functions that enable a microservices and API-driven approach, including the basics like authentication and identity access management services, metrics to

ensure performance and uptime is monitored, and basic security provisions including throttling overuse where resources can be more efficiently called and to prevent malicious targeting.

When an API management solution is in place, an enterprise can focus on reorienting their architecture towards an API/microservices approach. This may be possible though a “lift and shift” move. In such an approach, existing services (SOAP) have an API bolted on and are then made available as new reusable REST components that can be used to speed up product development without wholesale changing the underlying legacy infrastructure. Others are taking a “build and replace” approach whereby when an element of the monolith needs to be carved out to be updated, that is done first to create an API and, over time, as the monolith is carved out more and more, you look around and suddenly you have a microservices network rather than a single code base.

API Management services are an essential part of the banking stack. Axway banking customers we spoke to as part of this research have been particularly impressed with Axway’s capabilities in assisting them with the API management solution. “We are usually a build kind of company, so at first, our developers were keen to build an API gateway and management solution themselves,” said one banking executive. “So what Axway gave us was a solution that is easier to implement quickly, that enables us to use less resources on developing and maintaining that solution. It was quicker and cheaper than building, and gave us a lot more functionality.”

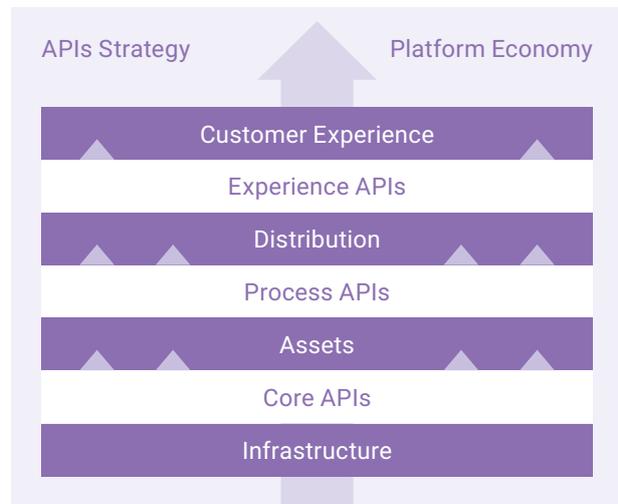
Interviews with banking executives and respondents to the *Banking APIs State of the Market* survey suggest that this process is now about halfway through for many banks. It is incredibly complex, and often requires upwards of 500 internal services to be redesigned as REST APIs.

Meanwhile, the Strategy-with-APIs approach is much more about how do you design an architecture that will enable a future platform and ecosystem to emerge, as that is the strategy play that will be required by banks to ward off startups and tech giants enveloping market share.

Creating an IT architecture that will support a Strategy-with-APIs business approach means being able to split datasets and business functionalities so that core business assets and infrastructure are kept close to the company, while distribution, content and

customer-facing capabilities are provided in layers that may be opened up to a wider selection of industry players.

This is what it would look like:



Core APIs here exist between infrastructure and assets. They are mostly for traditional IT purposes, and speed up product development and internal data sharing across business units and geographies. Jeff Bezos’ infamous email arguing for all new business components to be built as APIs is a good example of the core API approach. Many of those weren’t intended for partner or external use, but aimed at allowing internal teams to reuse code blocks when building new products and features. Product management still very much comes into play here: internal teams need great documentation and intranet resources that allow discoverability of the APIs build in other business unit teams.

Interviews with banking executives suggest that it may be politics that prevents this from occurring smoothly within banks. Almost half of survey respondents (44%) indicated they have a central API team, while 29% have an API center of excellence. Often these teams are charged with writing the API standards and style guides for a bank, and are available to work with individual lines of business on the APIs they develop.

“We have a hybrid approach,” explained one banking executive. “We have a centralized group that provides delivery support functions: a set of libraries that implement cross cutting concerns for all APIs, token validation, logging and metrics. The libraries are then picked up by the line of business that is delivering the API services for use. They write their own code, they use these libraries, and they deploy in a mostly standardized way. There is about 70-80% of business units using this methodology and one or two lines of business that are outliers and doing it their own way.” This experience was fairly common across banks interviewed.

Process and Business APIs sit at the assets and distribution layers of an industry vertical. These are mostly released as partner APIs and enable automation and speed of transaction between a business and its suppliers, partners, agents, resellers, and other key relationships.

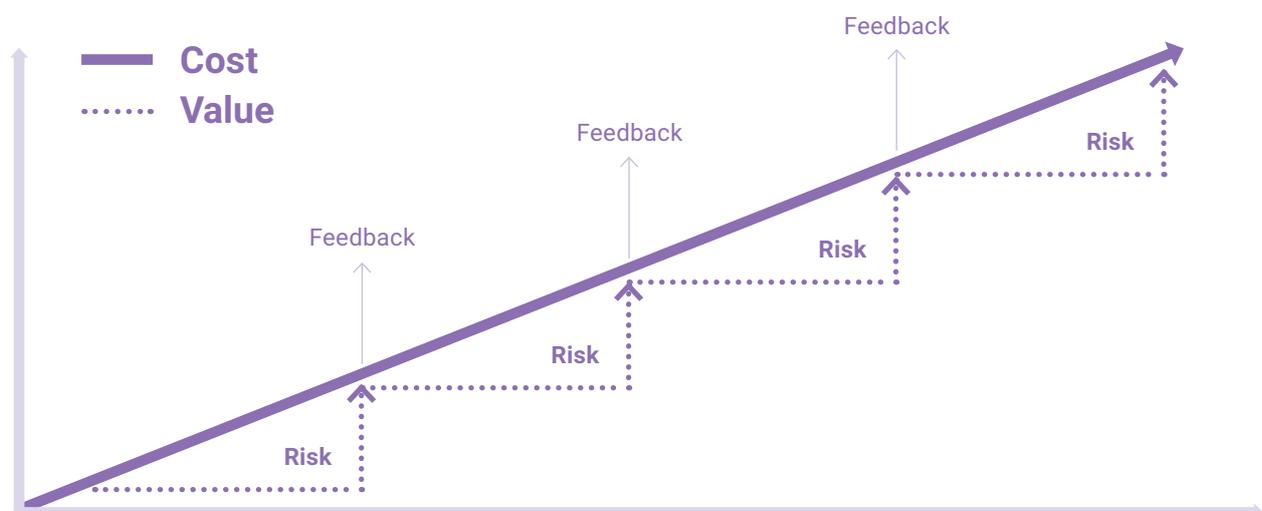
Experience APIs then sit on the top of the industry vertical and exist between the distribution and customer layers. These can be very narrow APIs, with very specific use cases, such as an API to create a chatbot, or an API facade that makes common business processes available for a niche market. These are the APIs that could be opened to third parties.

This sort of structure for API design would mean a bank would become much closer to being able to seed an ecosystem. Core and business/process APIs

are protected while third parties are encouraged to create new products and services using an enterprise’s experience API layer. Startups were going to start at this point anyway, so the benefit of providing experience APIs is to enable a closer watch over how and what those startups are building. As discussed above, these startup speedboats can zip through the financial services industry waters much faster; but by standing on the deck of the enterprise ship, banks can keep an eye on where they go, and how they get there. A bank could validate new product features and see what sort of customer engagement strategies gain traction.

Because an API management solution is in place as part of the architecture, enterprises remain in control: they can define the reasons why third parties can make API calls, they can manage scopes to ensure authorizations remain within agreed boundaries, and can measure uptake by monitoring what sort of apps and domains are increasing in their number of calls. An API management solution gives a bank the who, what, where, how much and how metrics of an API, so it is easy to measure the value that the API is creating.

This approach also reduces risk for the bank. Incumbents need 18 months to 2 years for product development lifecycle because they are currently weighed down with legacy systems (on all fronts: IT infrastructure, business organization, and internal culture). That makes major releases highly risky if they do not have strong market fit. By releasing experiential APIs to third parties working in niche sectors, that risk is reduced so that it is containable and more easily monitored. The feedback loops for large banks and banking groups, which had the slow steering momentum of a large ship, shortens, as small experiments are made by third parties.



2. Using RISK to Maintain Industry Advantage

Over a shorter time than if a bank goes it alone, they will have a wealth of information on what products and features are resonating the most with customers, and how customers want those new features delivered to them.

If a bank has built the experience layer right, APIs may have been released for specific niches (what industry analyst Paul Rohan calls microsegments) rather than for the industry sector and market as a whole.

Banks could now take on a RISK approach, by choosing a tactic from Rally, Invest, Steal, or Kill.

Rally: With an ecosystem of third parties that are using a bank's APIs to deliver new products to a specific target customer segment, a bank can watch which startups are building strong customer bases and high demand products. The bank can rally together with these third parties in closer partnerships in order to strengthen the offering they provide to the market. In the banking sector, you can see this at the moment with banks like ING in Europe working with online lending startup Kabbage to offer loans to online customers, and the new partnership between TransferWise and BPCE.

This is also what you can see at BBVA startup scouting program, and what Danske Bank is doing with its Hub concept, that provides supports and platform services to early stage startups.

Invest: Instead of partnering, another option is to invest or acquire a startup that is proving successful. This often has the benefit of bringing in expertise in customer experience and lean innovation methodologies as well as the products that the startup has been building and the market share they have been carving out. Again, with the banking sector, this can be seen with JP Morgan Chase's acquisition of API-driven payments platform WePay. We can see that out of the 20% of top 50 bank-acquired fintechs in the past 5 years, all were at some point exploiting APIs, or scraping bank's websites.

Steal: As the saying goes, good artists copy, great artists steal. Using this tactic, an enterprise can see how startups are using their experience APIs and then pretty much just replicate that approach and offer it to their own clients.

Startups know, and are not especially afraid of this risk. "The big banks will try and copy everything we do," Starling Bank CEO Anne Boden has said, for example, while Nikolay Storonsky, CEO of Challenger bank, Revolut, has said: "They may copy some of our savings products twelve months after we have launched them, but by that time we have three or four other features in this area and we're moving onto the next big thing."

Danske Bank and BBVA are two examples of banks seeking to onboard fintech as future ecosystem partners



DANSKE BANK'S THE HUB PLATFORM OFFERS RESOURCES TO FINTECH STARTUPS.



FROM BBVA'S STARTUP SCOUT PROGRAM OVERVIEW

But the strategy of banks here is not to be the first to launch new features. That is not possible. But thanks to API management services as part of their stack, and their nurtured startup ecosystem that makes use of banking APIs, they will be able to identify new successful features based on how their assets are used by their API consumers, and they will be able to scale effectively, which is the main challenge for startups competing against them.

Banks are slow movers, but fast and strong followers. When they move, it is late but it is strong. The role of API management in open banking is to reduce the lateness and increase the accuracy of a bank's every move.

Kill: It is your data, your assets, your infrastructure. While we do not personally recommend this strategy, as it can destroy the fledgling ecosystem that a bank might be cultivating and create long term distrust amongst developer communities, there are industry examples where businesses have offered third party APIs and then once the business has seen how they are used in the market, they have then cut them off and used those learnings for their own business strategy. Unfortunately, the examples that spring to mind are more from businesses that once started as startup disruptors themselves. Twitter famously dialed back its APIs once they saw how they were being used. LinkedIn and Crunchbase once scraped business data from other sources and have since chased after businesses that have sought to use their own APIs as a BI firehose, and Netflix cut off their API and moved to internal APIs. Most recently, Google Maps has increased its pricing policies for its API to such a level that it may end up killing a number of startups simply by pricing them out of the market.

Learning from History: Platforms Have Proven the Model in the Past 20 Years

The approach suggested above — first working on a strategy with APIs, and then applying RISK tactics — is the next horizon for open banking platforms as they grapple with implementing their new banking stack.

There is nothing standing in the way of banks, who already own much of the vertical slice, from implementing this model. And history shows us that if they don't, others will leverage customer experience and do it instead until those new upstarts gain significant market share.

That's definitely how Stripe built themselves into a \$20 billion valuation. When Stripe started, all banks had payments services. All of them, without exception, had the infrastructure that Stripe needed to build to succeed. But because banks weren't focused on providing experiential APIs for developers to use to make payments frictionless in apps and websites, Stripe was able to come along and created that digital infrastructure. So that was a \$20 billion API opportunity that banks missed.

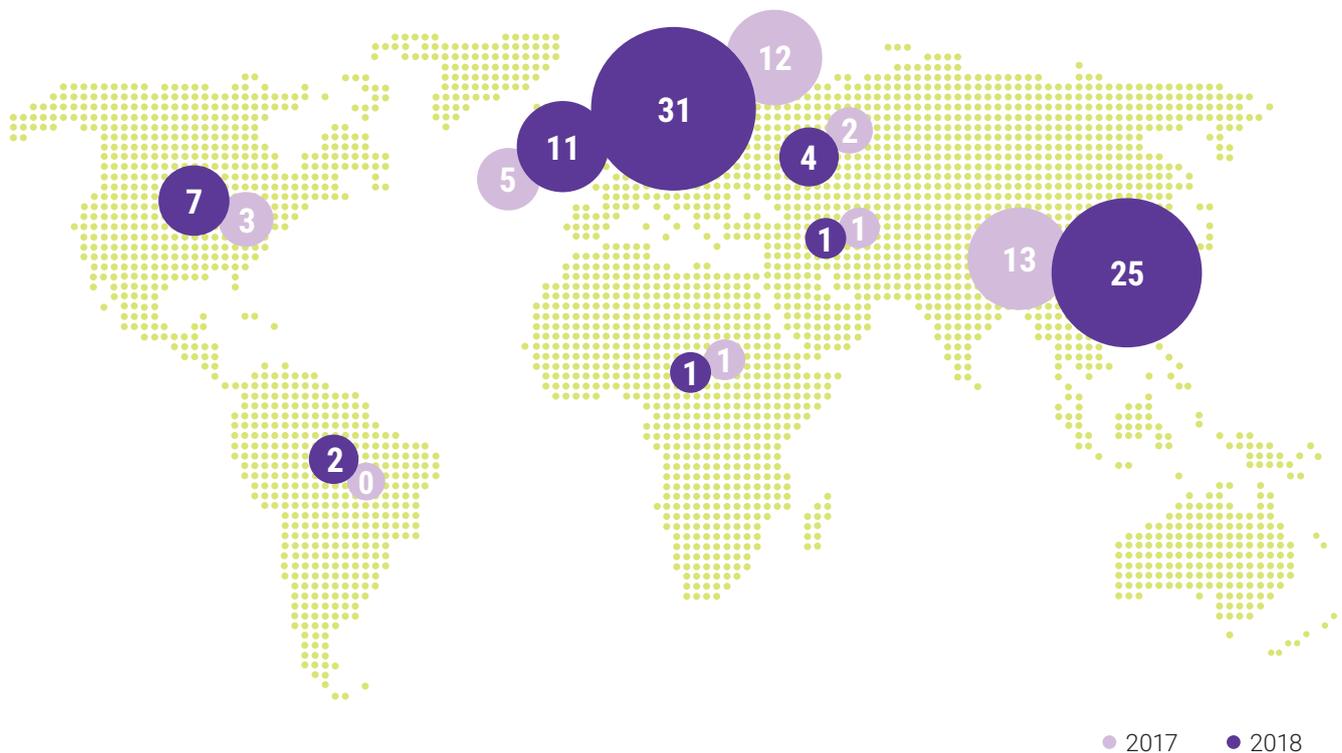
This is what industry enterprises are most scared of with startups: that they will become a platform that takes significant market share, rising up through customer experience first and then building out.

The question now is not whether incumbent banks can do anything about the next platform upstarts, but more, are they willing?

Open Banking Platforms

Progress to Date

There are now 64 open banking platforms around the world, a growth rate of 73% in the number of platforms since the end of 2017. Asia/Pacific and Europe/UK/Scandinavian regions are seeing the greatest growth, spurred on by new regulatory environments.



37

Number of open banking platforms at end of 2017

64

Number of open banking platforms at end of Q2 2018

73%

Growth in number of platforms



Asia/Pacific and Europe/Scandinavia were the fastest growing regions in the first half of 2018

Country	2017	2018
Asia/Pacific	13	25
Latin America	0	2
North America	3	7
UK	5	11

Country	2017	2018
Europe and Scandinavia	12	31
Eastern Europe and Russia	2	4
Middle East	1	1
Africa	1	1

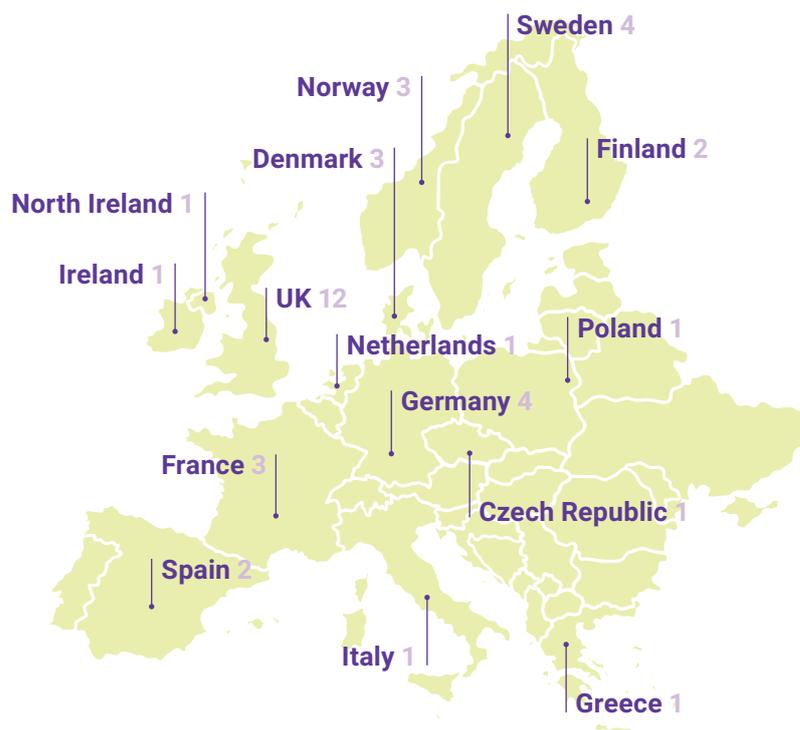
Open Banking Platforms

Europe, UK & Scandinavia

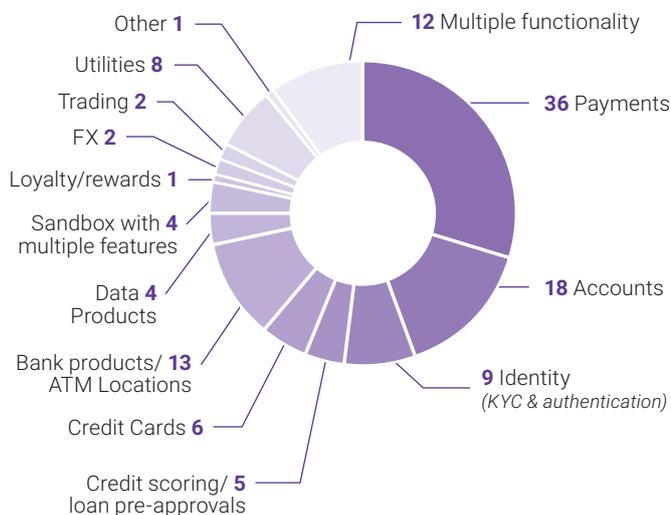
Open Banking Platforms



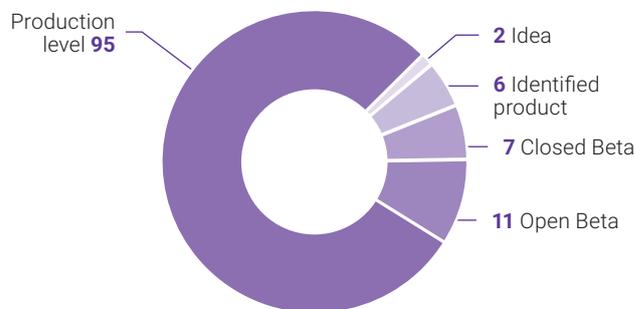
Open Banking Products



API Products



API Maturity



In Europe, 79% of APIs being made available are released as production APIs. Several open banking platforms are including API ideas as future products in their catalog so that the banks can gauge the interest from visitors to the developer portal.

Open Banking Platforms

United States & Canada

Open Banking Platforms

3
2017

6
2018

100%
growth rate



Open Banking Products

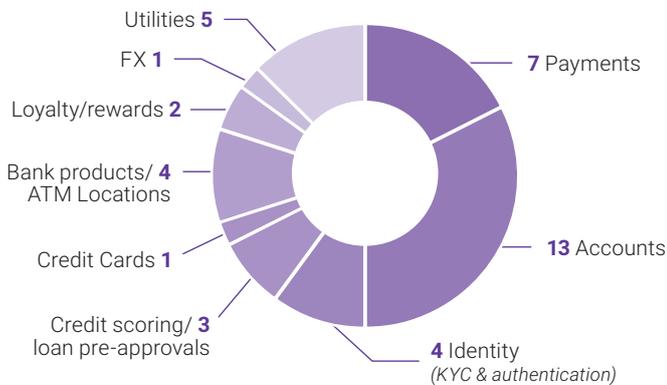
9
2017

40
2018

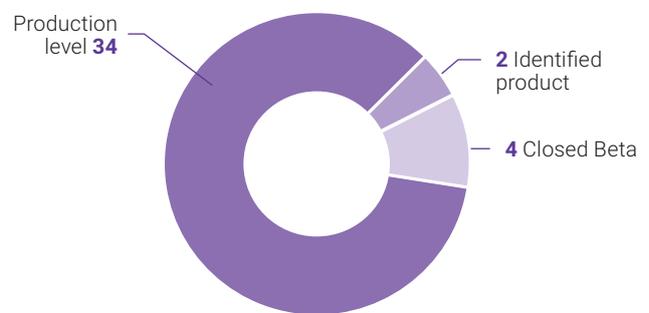
344%
growth rate




API Products



API Maturity



In the U.S. & Canada, 85% of APIs being made available are released as production APIs.

Open Banking Platforms Asia Pacific

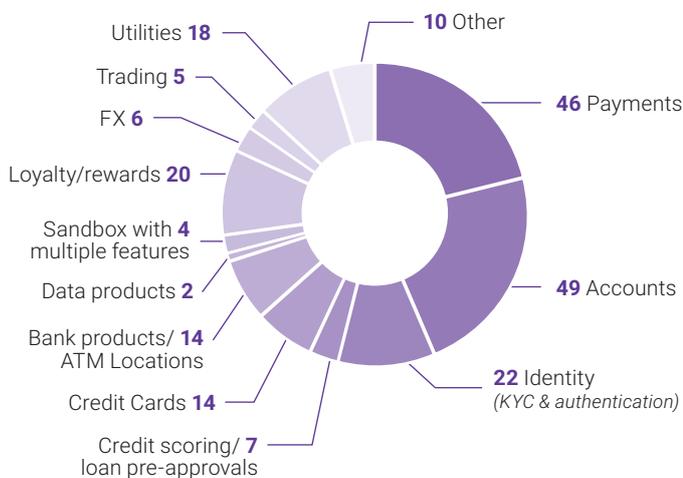
Open Banking Platforms



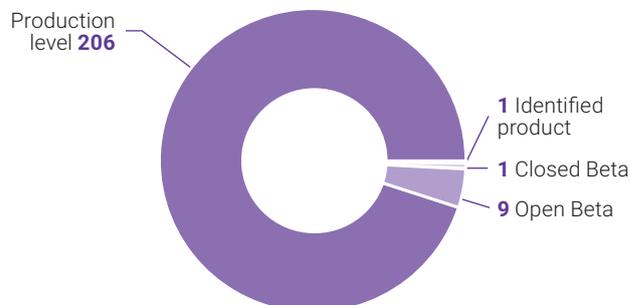
Open Banking Products



API Products



API Maturity



Across Asia and the Pacific region, the majority of APIs are available as production APIs. The large number of production APIs for specific functionalities being released by DBS Bank (Singapore) and OCBC (Singapore and Malaysia) does skew results to suggest more activity in the region than is apparent across all banks.

Open Banking Platforms

Latin America, Eastern Europe, Middle East & Africa

Open Banking Platforms

3
2017

5
2018

67%
growth rate



Open Banking Products

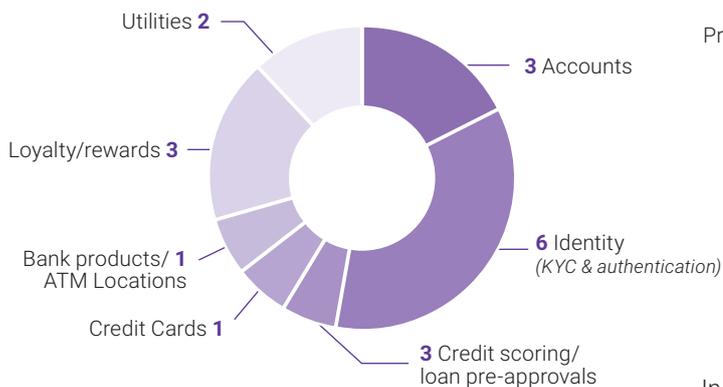
6
2017

17
2018

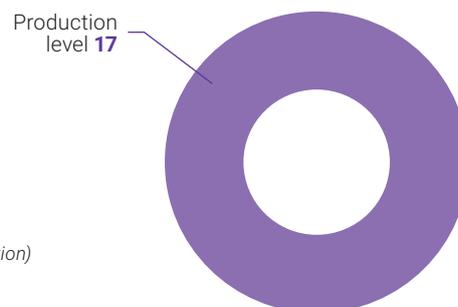
183%
growth rate




API Products



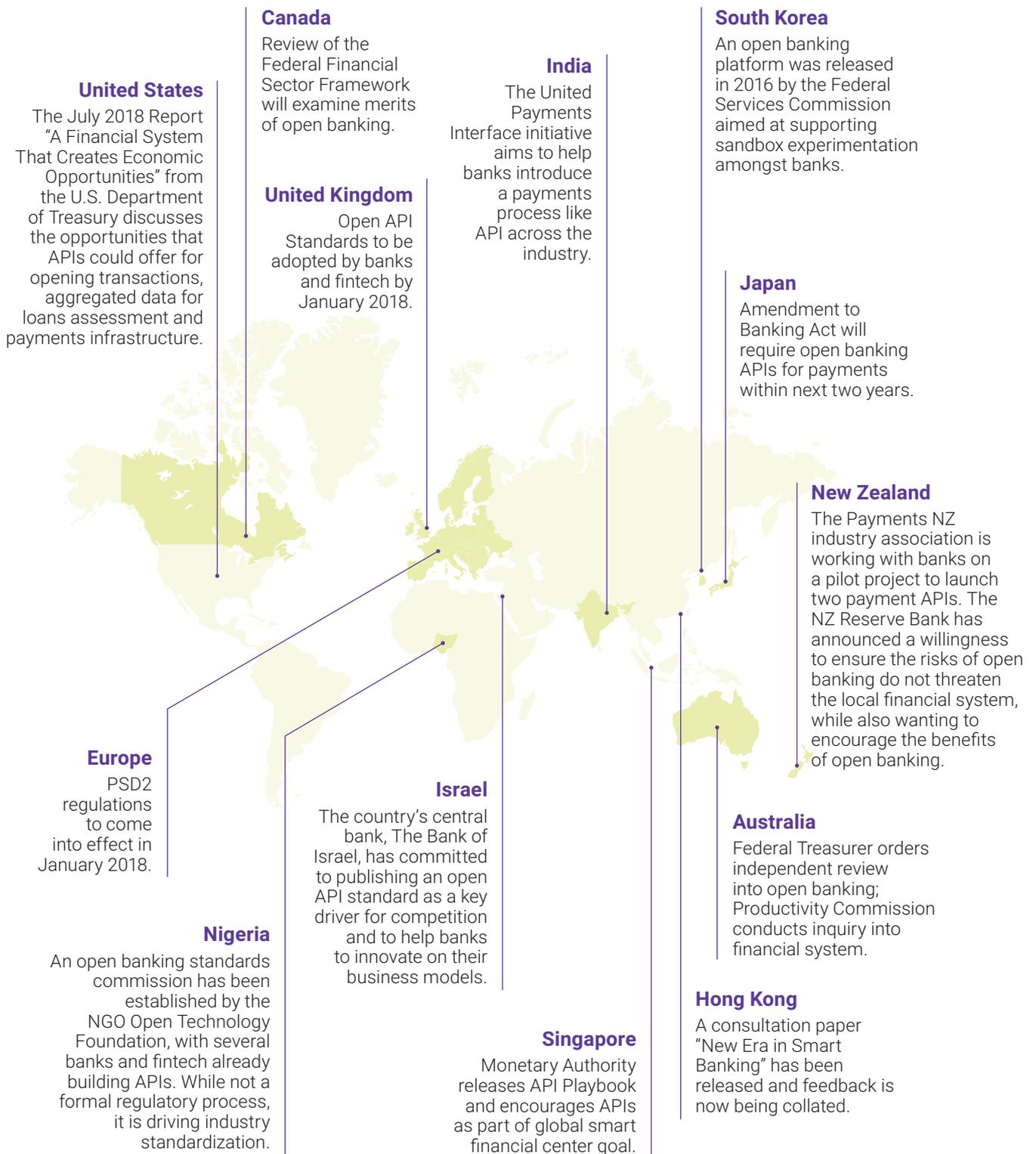
API Maturity



In the rest of the world, all open banking products are available as production APIs.

Regulatory Environments and Banks

There are now 12 regions around the world that are considering introducing or have implemented new regulations to drive open banking. Europe and the UK have already introduced regulations, but many of the European requirements do not become enforceable until March 2019.



Are Regulations a Driver for Open Banking?

Mixed messages from banks suggest that while some banks are complying with the rule of the law, those showing open banking leadership are being driven by a more far-reaching view of the market horizon.

The UK and Europe's open banking regulations are now beginning to have a ripple effect internationally, with other government jurisdictions considering how to introduce open banking compliance frameworks.

While the regulatory environment has been established in the UK and Europe, there is not yet an inspired zest amongst banks to make open APIs available. In the UK, progress seems very much focused on meeting the rule of the law at its least impactful. The UK's Competition and Markets Authority (CMA) requires banks to open up product data via API, and traditional banks have conformed to this but are doing little more (see page 13 for a breakdown of open API product categories in UK and Europe). This is in sharp contrast to challenger banks, such as Starling and Monzo. While Monzo has not prioritized a production-capable API for third party access as yet, citing regulatory constraints, Starling has moved already towards creating a marketplace for third party products built off their API.

In Europe, some leadership banks are using the PSD2 regulations to establish relationships with fintech application developers. Banks like BBVA have been spearheading open APIs for several years now, with a suite of APIs available for integration into new products, Erste Bank, a Baltic banking group, started by opening APIs for their Czech Republic bank and are now replicating that model across other national banks in the consortium. While they see 80% of API usage coming from corporate customers who are integrating APIs internally to their systems, they do also have some third party innovators creating new products, such as Upvest, a real estate investment platform built using Erste's APIs.

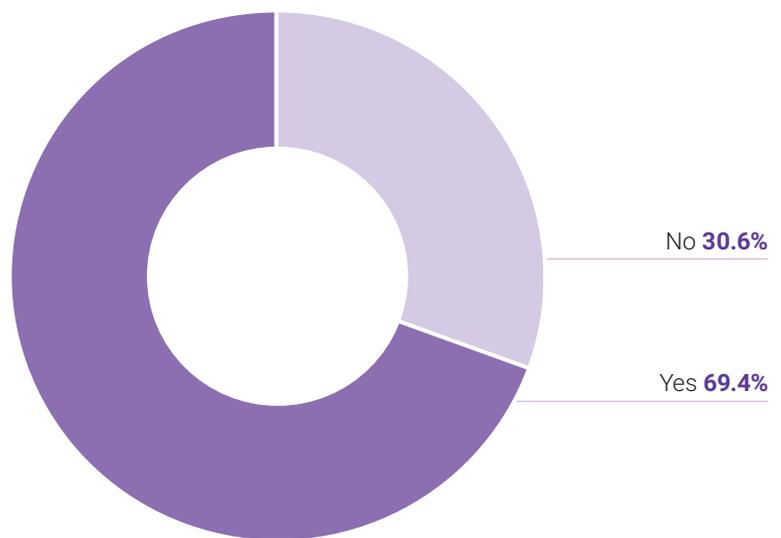
In Scandinavian countries, several players had already been considering a move to APIs. Areas like Norway have had regulatory environments and agreed standardized approaches for sharing data and common payments infrastructure, so now banks in those nations are building APIs to adhere to the PSD2 regulations. Banking executive interview respondents recognized that open APIs will also bring new types of competition, so while they do not see as much of a need for open APIs for payments facilitation as other countries may have, given they already have standardized payments infrastructure, they do want to move forward with open APIs in order to ensure continued opportunities to remain at the forefront in digital banking, where banks have managed to hold onto their lead in customer relationships.

Managing regulation as part of the banking stack

Across both UK and European jurisdictions, and around the world, managing regulatory compliance appears to be disconnected from open API programs.

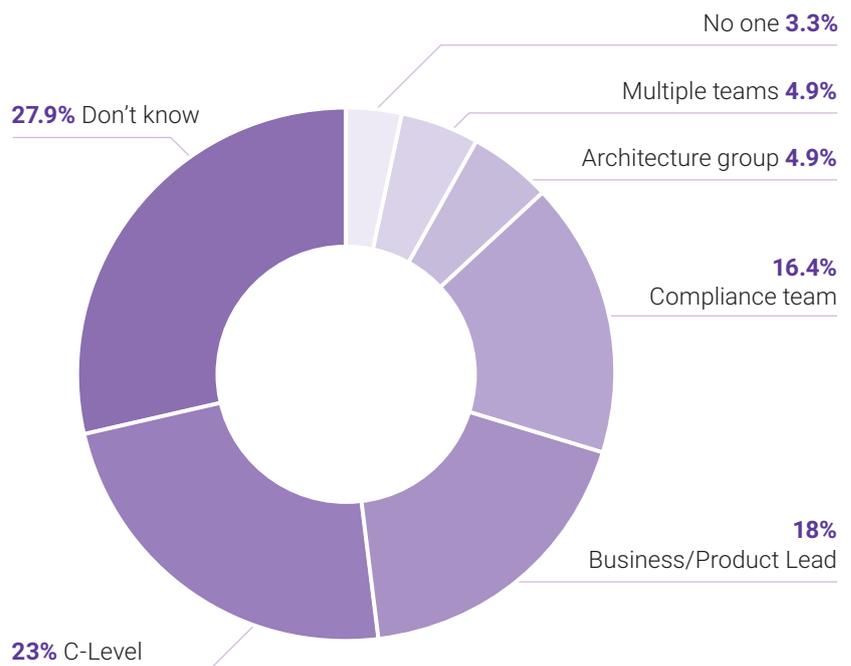
API team directly involved in regulatory adherence (N=61)

Amongst banking staff responding to our survey, 31% of respondents were working in API teams that did not have direct involvement in regulatory compliance. Close to one third (28%) were not able to identify the internal team responsible for regulatory compliance.



Team member response for ensuring APIs comply to regulation (N=61)

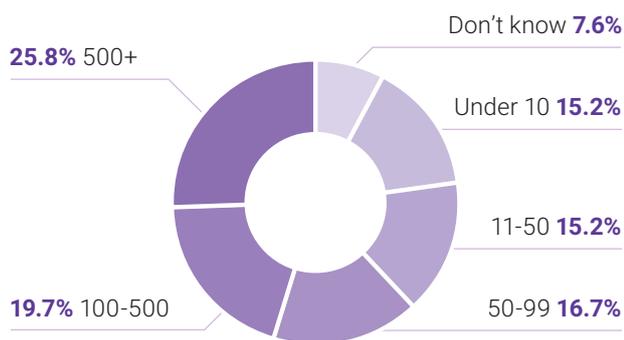
Compliance was being managed by members of the C-suite (CEO, COO, CSO, etc.), by 23% of survey respondents, 16% by a dedicated compliance team, and 18% from product ownership and management teams. In a small number of cases, compliance was recognized as a cross-cutting concern (5%) or managed by the technical teams (5% cited either architecture teams or developers as the compliance manager). Disturbingly, 3% said "no one" manages regulatory adherence at their institution.



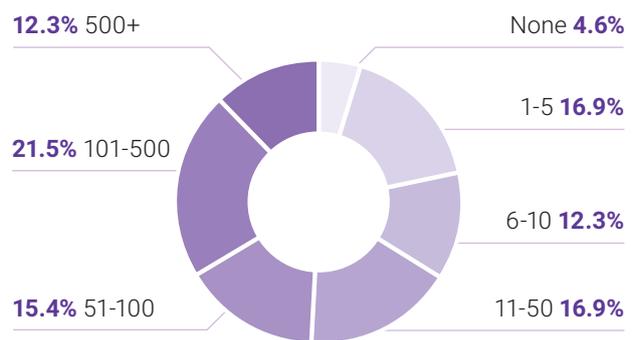
The New Banking Stack: Microservices and API architecture choices

The complexity of banking IT infrastructure is creating a backlog that means many banks are still only halfway through a modernization program. REST APIs and the Open API specification format are slowly becoming standard technology choices, but there is still some work to do to reorient all existing architecture.

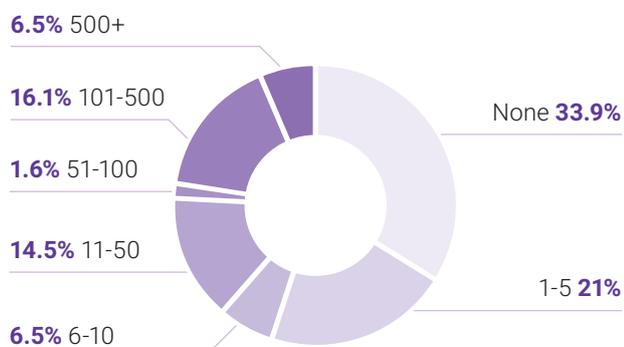
Number of estimated internal services (N=66)



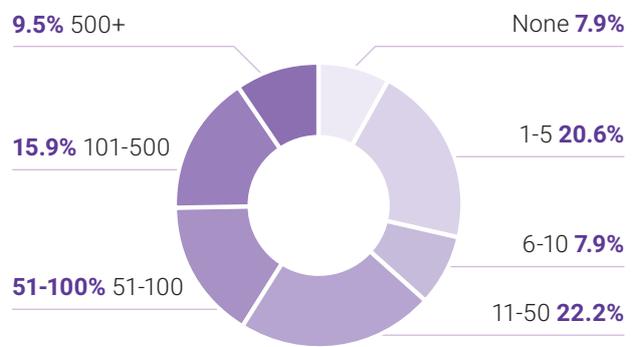
How many APIs do you have amongst those internal services? (N=63)



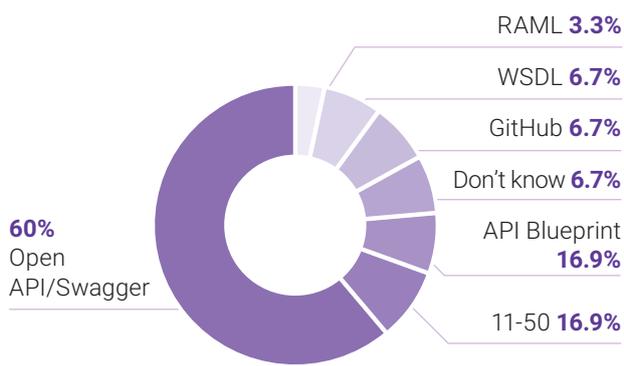
Number of SOAP APIs (N=62)



Number of REST APIs (N=62)



Are you using an API definition language? (N=60)



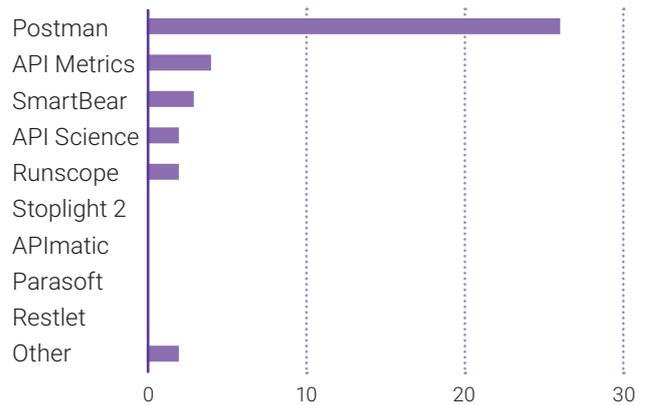
API architectures within banks are incredibly complex, with a quarter (25.8%) of survey respondents calculating they have more than 500 internal services. The majority of those services are not yet API-based, although there is clearly some reorientation: 33.8% of survey respondents indicated that more than 100 of their internal services are API based (out of the 45.5% that have more than 100 internal services).

While many banks commenced an IT modernization strategy several years ago, the majority of those interviewed have indicated they feel they are still only "half way through" the process. This is evident in the similar number of large SOAP and REST APIs within banking systems, although the transition from SOAP to REST is also evident: a third (33.9%) of respondents said they no longer have any SOAP APIs, compared with 7.9% who have no REST APIs.

Reflecting the current legacy transition from SOAP to REST, 6.7% of survey respondents are using WSDL files to define their APIs, while Open APIs, API Blueprint and RAML are used to define APIs amongst 70% of survey respondents.

The Open API Initiative (OAI) is clearly becoming the new standard amongst banks looking to use an API specification format and will be essential to the success of open banking ecosystems, as the specification allows third party and partner developers to quickly understand the capabilities of a bank's APIs and integrate it into their products and services. The OAI specification creates a new way of standardizing the Banking API Stack around a unified API description format, and enables more open banking API tools to be created; for example, the recent OAI PSD2 verifier and the OpenID Connect OAI verifier.

Do you use any API lifecycle tools? (N=41)



There is a low level of usage of API lifecycle tools indicated by both survey respondents and in banking interviews. The majority of bank interviewees indicated they either use their own internally built tools to create APIs, or the API team does not prescribe tooling for lines of business to use when departmental teams build APIs, instead focusing on creating style sheets, and standard libraries that teams are encouraged (but often not obligated) to use.

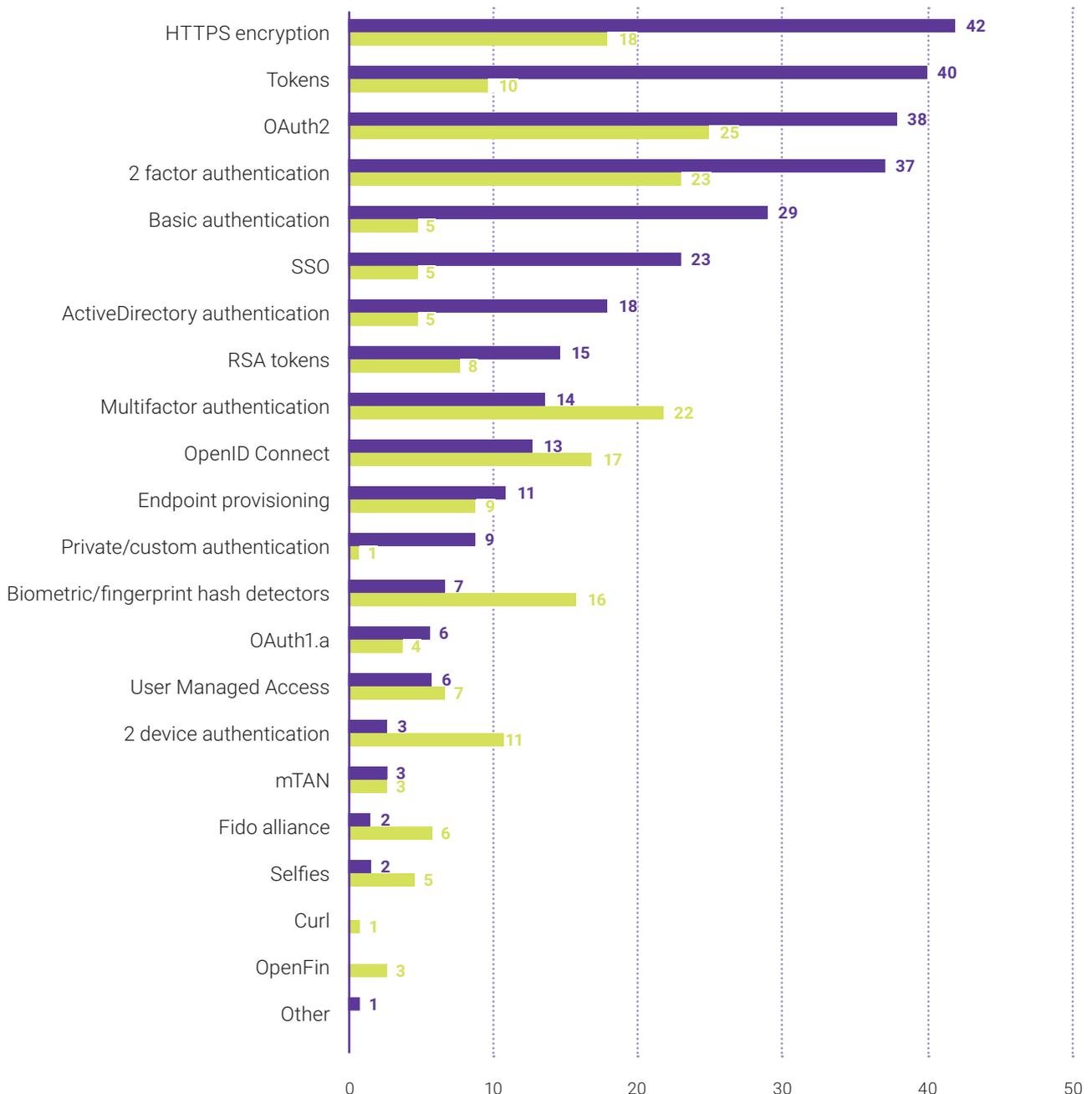
"We already started some years ago to modernize our infrastructure, and now that is being driven by the regulation. We have an ESB and SOA internal architecture that we are moving towards a microservices architecture approach. We have containerization, microservices running on cloud, and DevOps approaches. We think open APIs have to be REST APIs, but we have a big core banking system. Most banks are based on the mainframe, so we all have a lot of legacy: it is about how to decouple what we need to do. We often have to have SOAP-based interfaces and then consume them via an open API gateway," described one banking executive, mirroring several other comments received during interviews.

The Banking Security Stack

Banks are recognizing the increased security risks that APIs bring and the new threat surface layer that can be exploited. Banks are instituting a range of security protocols and are considering more, all recognizing that one solution will not be enough.

API Security measures

● Currently in place (N=55) ● Considering (N=50)



Many banks have standard HTTPS encryption, tokens, OAuth2 and 2-factor authentication already in place for their API security management. However, the majority of banks do not feel that this is yet enough to ensure ongoing protection of customer data. 76% of survey respondents are experimenting and testing additional security measures, with OAuth 2, 2-factor or multifactor authentication, HTTPS encryption, OpenID Connect and biometrics being considered by at least a third of respondents.

“The recent API-based breaches at Google and Facebook were a wake up call for many enterprises,” says Bernard Harguindeguy, CTO at Ping Identity. “If these organizations, which are considered to have top technical talent, were breached via attacks that exploited APIs then it could happen to all of us. It took 14 months for one to discover the breach, so it begs the question and makes me wonder that others are already under attack and just don’t know about it yet.”

Harguindeguy believes this uncertainty is one of the drivers for testing new API security methods. “I believe most are realizing that access control is not enough to secure an API and that more is needed. That has raised the interest in securing APIs and, I venture to say, that every bank will fund projects to explore, identify and deploy solutions that address the cybersecurity needs of their API infrastructure — especially in the context of PSD2 and Open Banking projects.”

Harguindeguy believes API security introduces particular new threats to open banking systems, but that many banks are aware of these risks and are now pursuing new technological solutions to counter these security challenges.

One banking executive explained their current security approach: “In terms of opening up our customer transactions via API, that for us was much more about customer security. In the past, we have been able to detect screen scrapers that were going through customer information, and that was a huge concern for us. We realized that was dangerous for our customers, so it became necessary to provide relevant APIs so that those who provide a great 360 view product to our customers, like some finance management software providers, that they can get the customer consented information through OAuth. Everyone at the bank saw the security problem so APIs helped solve that.”

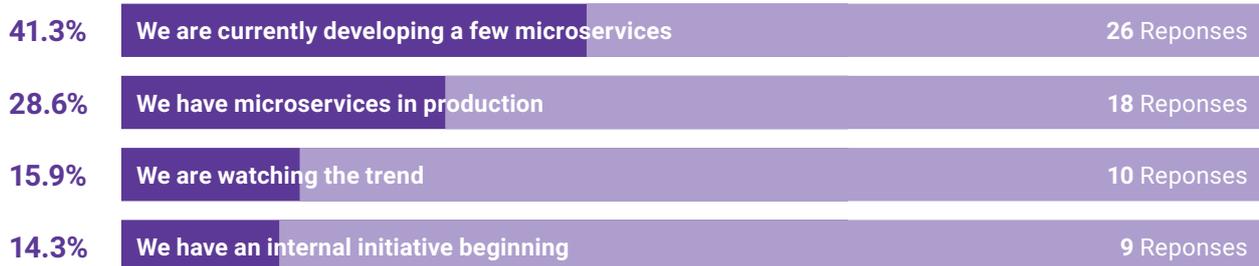
Another banking executive spoke of how security is managed as part of the governance process: “When we create new APIs, the line of business department owner must fill in a risk return decision matrix and make a security statement on it. We ask about measures for security against penetration, and for risk management. If sufficient security measures are in place and everyone agrees, we can release the API.”

“It starts with the recognition that API based attacks are a new breed of sophisticated attacks — sometimes using AI and automation extensively. This is no longer about a SQL injection or XSS attack. It’s about reverse engineering APIs to identify how to best get to data and applications. It’s about attacking the credential system to log in with a stolen identity, stolen token or stolen cookie. It’s about the theft of data and private information via APIs, and about disabling APIs with finely tuned, low volume, targeted DDoS attacks. I believe that most banks are tackling this right now and assembling teams to identify and deploy solutions. This has become a board-level discussion for many. Leadership is about recognizing the issues upfront and assembling teams that can provide guidance on proper API design security techniques, and recommend solutions to deploy that can track every activity on an API and identify and block threats and abuses.”

The New Banking Stack

Banks are moving towards microservices architectures and are regularly testing new technologies. Around a quarter of banks are committing to open source technologies.

How would you describe your company's microservices architecture? (N=63)



Use of new technologies

● Testing internally (N=61)

● Using in production (N=57)



Banks are currently testing a number of new technologies to assist them reorient towards an open API architecture. 76.2% of survey respondents are currently implementing some facets of microservices in their architecture, while all remaining survey respondents are watching the microservices trend closely. A containerized, microservices architecture is the most widespread design pattern, currently being tested by two-thirds of banking survey respondents (66%). Some of these are continuing to test the possibilities, others are starting to put them

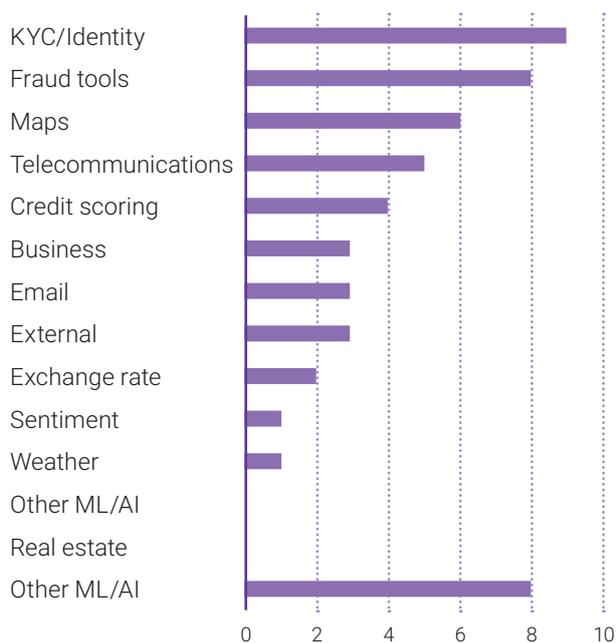
into production. 44% of survey respondents have some containerized architecture in production at present.

Kafka and message queuing technologies are also being tested amongst almost half of survey respondents, with about a quarter already moving to production use cases. Load balancing technologies like NGINX and serverless are also seeing testing and production-level adoption. While not quite making it to production usage yet, GraphQL is being tested by 21% of survey respondents.

The Banking Integration Stack

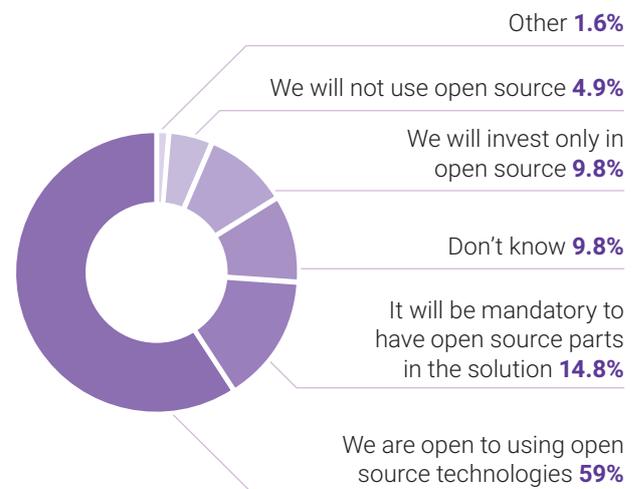
Banks are beginning to look at using existing technologies including open source to weave into their infrastructure stacks, but the consumption of third party APIs is low.

Does your business use APIs from other providers (N=41)



Strangely, bank survey respondents were not high consumers of external APIs. Apart from KYC/Identity APIs and some fraud tools, usage was fairly low. (This would suggest that those 26 respondents that indicated they are using Postman as part of their API lifecycle toolkit may be doing so for testing of their own APIs rather than to validate consumption of external APIs.) These survey findings were confirmed in banking executive interviews, with few interviewees highlighting any specific external consumption of APIs. This could also help explain the slow uptake of open banking APIs amongst the majority of banks: without an internal API culture that consumes APIs and understands the value of APIs, there is little enthusiasm for identifying business use cases amongst one's own web services.

Use of open source technologies



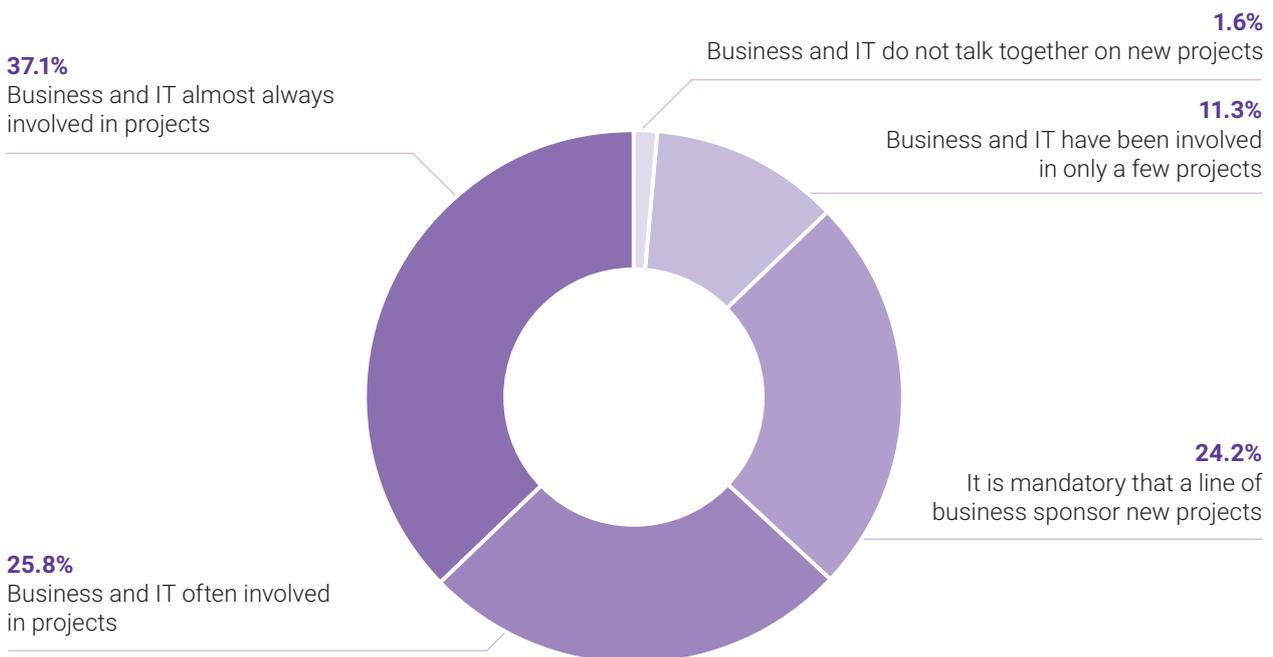
This may change with the current gravitation towards open source technologies. 60% of survey respondents are open to using open source, which was also reflected in one-to-one interviews, with one quarter (24.6%) believing their organization will either mandate use of open source or significantly invest in open source tech, while only 4.9% were sure that their institution would not invest in open source. One banking executive noted: "We have an open-source first policy: Before we look anywhere else, we look in the open source community for technology solutions, as they are often the leaders."

Another banking executive shared how they moved towards a build rather than buy culture internally: "We came to the conclusion that the market was volatile, tech is shifting very quickly. Partially out of that volatility, our VP of architecture said screw it, we are going to get a team of open source experts to look at best of breed open source. We will go cloud native, be friendly with GitHub, Jira, Slack, and Jenkins, and see what we can do in a cloud mode compatible with AWS and Azure. We decided we want to try and compose something rather than build from scratch..."

APIs as a business concern: The People Stack

Banks are beginning to ensure business units are leading API efforts.

Business and IT collaboration maturity (N=62)



There was some mismatch between the reporting of business and IT relationships amongst banking survey respondents and interviews with banking executives. Survey respondents reported that overall, business and IT departments do work together on API projects, with 24.2% indicating it is mandatory that a line of business lead an API effort, and only 12.9% of projects have minimal or no collaboration between business leads and IT.

Banking executives interviewed were more circumspect. Amongst banks where regulation was a key driver for commencing an API program, the majority were still struggling to explain and appeal to business leads around the opportunities that APIs could create.

One bank had focused on the API reorientation to date, but had not yet opened APIs more publicly: "We have a platform deployed but it has not been opened up outside of the bank as of yet. We have a small handful of APIs that look like good candidates for that, but not a ton of business interest in that market."

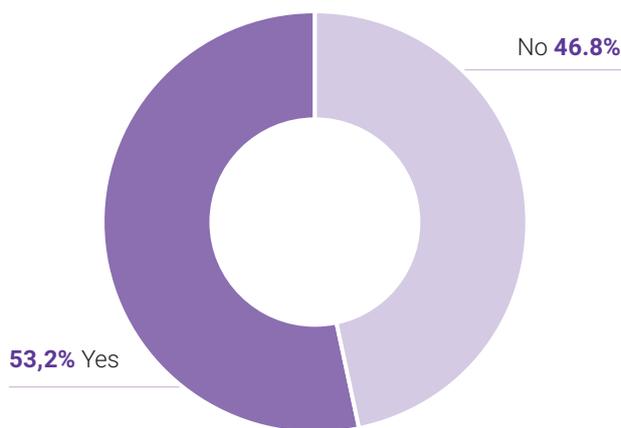
This was a common experience amongst several banking executives. "APIs are not an overall business strategy yet," said another interviewee. "Because of PSD2, the bank has thought about APIs, so our IT department pushed the bank to think about new business models and potential ecosystems. So we are seeing more lines of business interested in APIs. It's not like an overall API-first strategy. But we do see a general direction, and there are multiple teams that are working towards that development."

One executive explained the disconnect: "Business people are very used to selling business products and they don't yet understand that APIs are new products. So there is a big learning curve, and still a lot of convincing to do. To counter that, we bring business in as early as possible in the conversation to have their involvement, especially in all new technology."

Internal governance

Banks are instituting a range of internal governance approaches to ensure risks are managed and to encourage standards are used in API creation.

Internal developer portal/intranet site with internal APIs (N=62)



Common tools and successful strategies are emerging to help large, multi-branded banks to navigate their open banking journey. While banks may each have different approaches to governance, some best practices are now becoming evident.

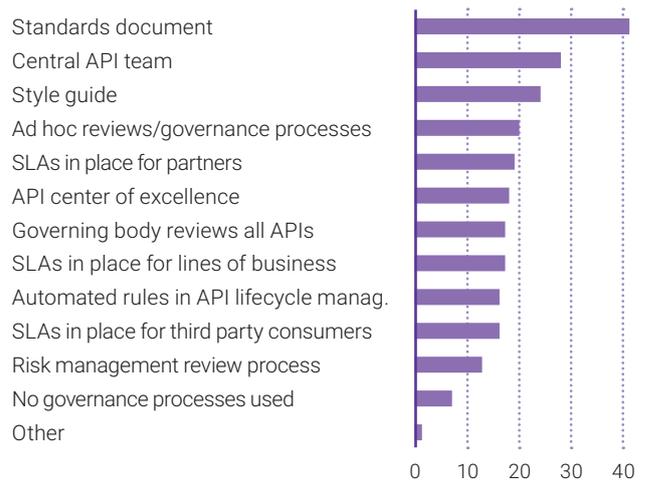
Internal governance refers to the way a bank manages an open banking API platform overall. Governance includes:

- Ensuring alignment of the open banking platform across all lines of business
- Assessing and managing risks associated with creating and releasing open APIs
- Providing security oversight
- Confirming adherence to regulatory requirements
- Signing off on business model and pricing strategies
- Monitoring impacts of partnership and customer agreements to use the APIs.

The processes banks use to manage internal governance vary, and with open banking platforms being so new, many have not yet established a coherent, comprehensive governance approach.

But amongst some of the early movers, common patterns are emerging. 65% of survey respondents indicated they have an API standardization document that is used internally. Almost half (44%) have a central API team that helps support lines of business to create standardized APIs and to help them build out other API-as-a-product approaches such as developer engagement resources and to help them work on future monetization

Internal Governance processes used (N=63)



models. 38% make use of a style guide. Between a quarter and a third have SLAs in place for internal usage (27%), partners (30%) and third party providers (25%). A quarter (25%) make use of automated rules. Disturbingly, only 27% have a governing body reviewing all APIs, and 11% indicated they have no internal governance processes in place.

Around half (54%) of survey respondents have an internal developer portal or intranet site to help engineering teams find APIs that have already been built for internal reuse.

One North American bank described their governance structure: "We have a governance committee: There is an executive steering committee that is chaired by the VP of enterprise, and every SVP attends, and they meet monthly. Then there is an architectural committee that oversees approved patterns, and that is governed through a council. Every project has to be reviewed at those committees, and they meet weekly."

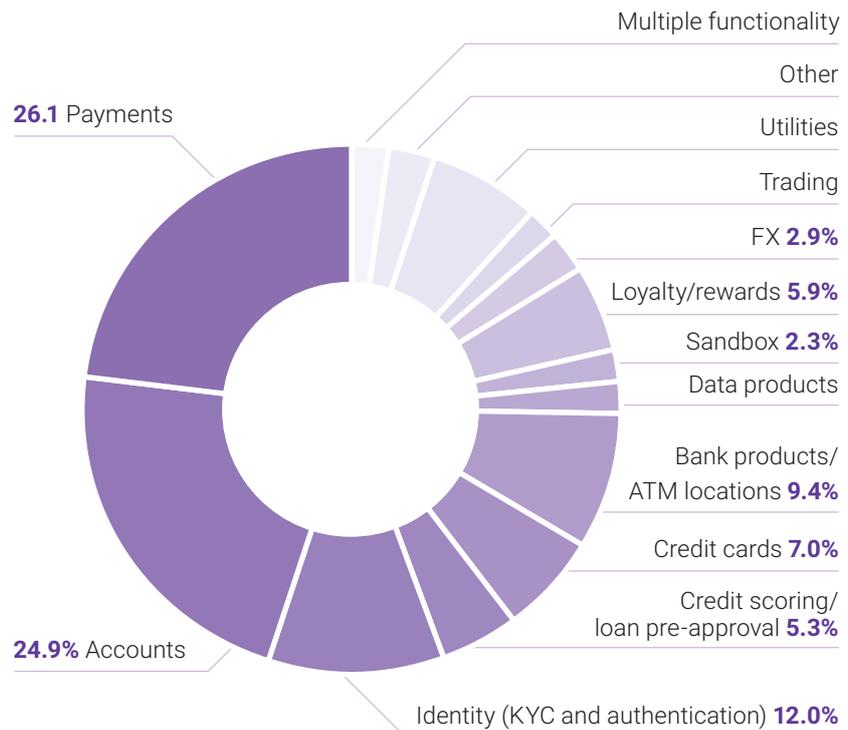
A European bank had a similar process, but made more use of internal catalogs to encourage reuse: "We have an architecture governance procedure so they are already controlling and contributing to the APIs. For the responsibility of the APIs, they have the interest, and they have to communicate in the repository and that is our master dictionary and they must communicate there. We have communication protocols to get understanding of why to use APIs. We try to avoid the redevelopment of APIs as much as possible. If you use the repository, and you see what is there, it is more business efficient because you reuse what we have."

Product prioritization

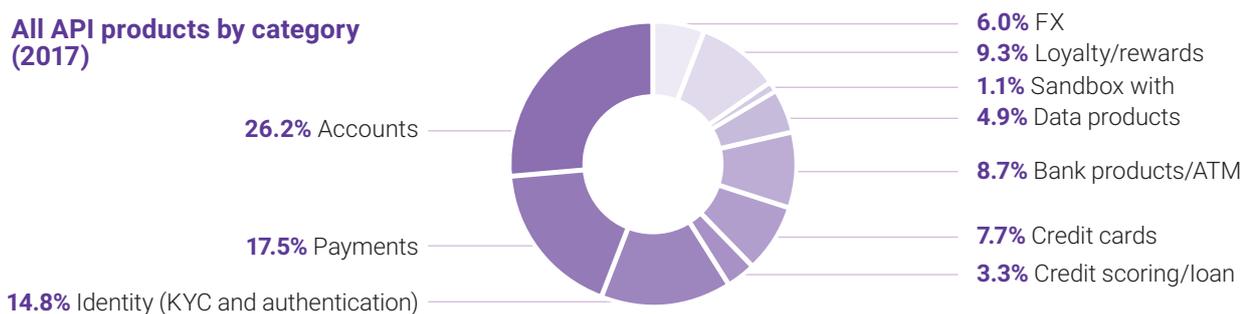
Payments and account information APIs are the two most common product categories for open APIs, but a range of capabilities are beginning to be exposed.

Number of APIs

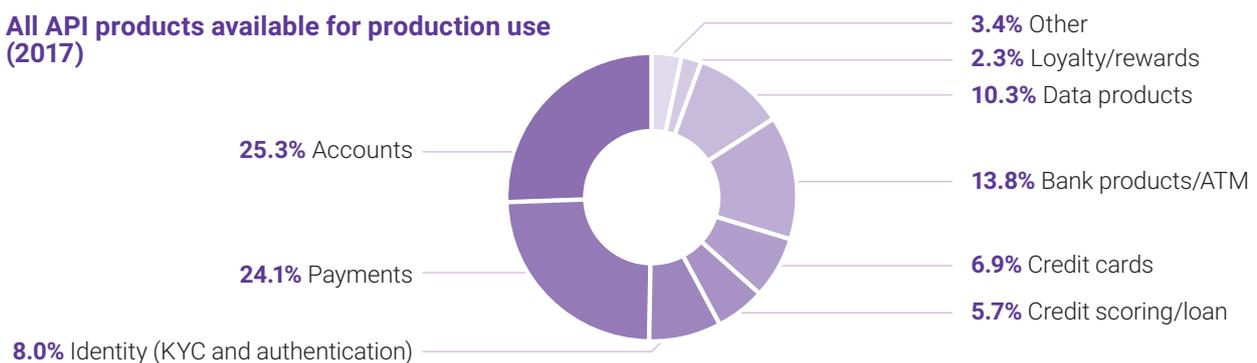
Payments	89
Accounts	85
Identity (KYC and authentication)	41
Credit scoring/loan pre-approvals	18
Credit cards	24
Bank products/ATM Locations	32
Data products	7
Sandbox with multiple features	8
Loyalty/rewards	20
FX	10
Trading	7
Utilities	26
Other	11
Multiple functionality	8



All API products by category (2017)



All API products available for production use (2017)



Reflecting the PSD2 regulatory environment, 2018 has seen growth in the number of payments (26% of APIs, the same as in 2017) and account information APIs (25% of APIs, up from 17.5% in 2017), with the majority of open banking APIs falling into one of these two categories. Payments, in particular, is an important baseline product category for open banking APIs, as payments APIs are needed to enable other types of financial services. For example, loans provision and repayments require payments capabilities.

Because of the unique regulatory environment in the UK where banking products need to be made available by API, 9% of APIs being created by banks fall into this category. This is also a “low hanging fruit” API, with minimal security concerns and ideal for teams wanting to experiment with building APIs. The challenge is that this type of API has limited use cases that can demonstrate the value of opening APIs. In other cases, banks are choosing identity and KYC processes (12% of APIs), another key capability that must often be first carried out via API before other types of transactions. Surprisingly, foreign exchange (FX) rates have reduced from being about 6% of all API products in 2017, to representing 3% of all APIs in 2018.

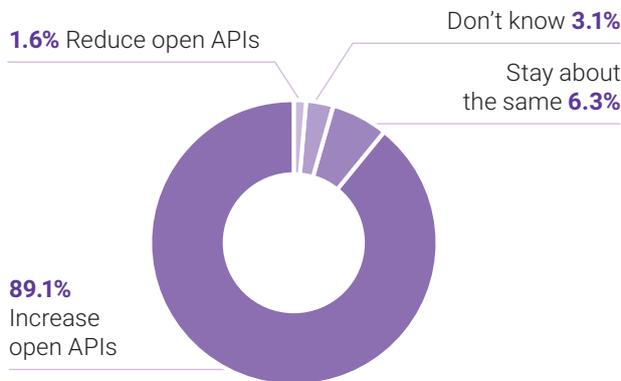
In interviews with banking executives, FX rates were often seen as a good contender for opening APIs, not so much because of innovation with external partners, but because

of internal efficiencies that could be created, as often banks with multiple groups and branches would need to regularly upload FX spreadsheet tables which slowed down manual processes, whereas an API could enable real-time, automated data to be used with less risk of error. “We are looking into APIs that can accomplish cost reduction,” said one banking executive. “For example, we provide cash exchange rates to hotels and airports. Every morning, we send an email of cash rates for the day. APIs could do a lot of cost reduction on that side. There is a lot of manual work that is repeatedly done on both sides, between the bank and the hotels and airports, and building an API would remove most of those inefficiencies.”

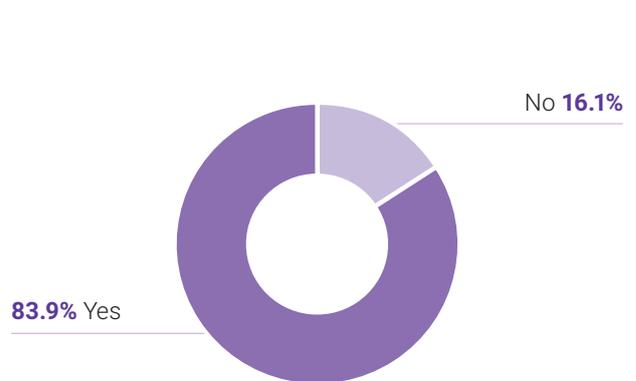
Credit cards (7%) and credit scoring (5.3%) are seeing interest from open banking platforms, where activity in Asia-Pacific countries is strongest.

The majority of survey respondents and banking executives, while feeling that open banking is still very much at the nascent stage with many of the necessary organizational components still needing to be put in place alongside the architectural reorientation, did indicate that they believe their organization will continue to release open APIs in the next three years (89%), with 84% indicating they are currently doing proof of concept prototypes of new open API products.

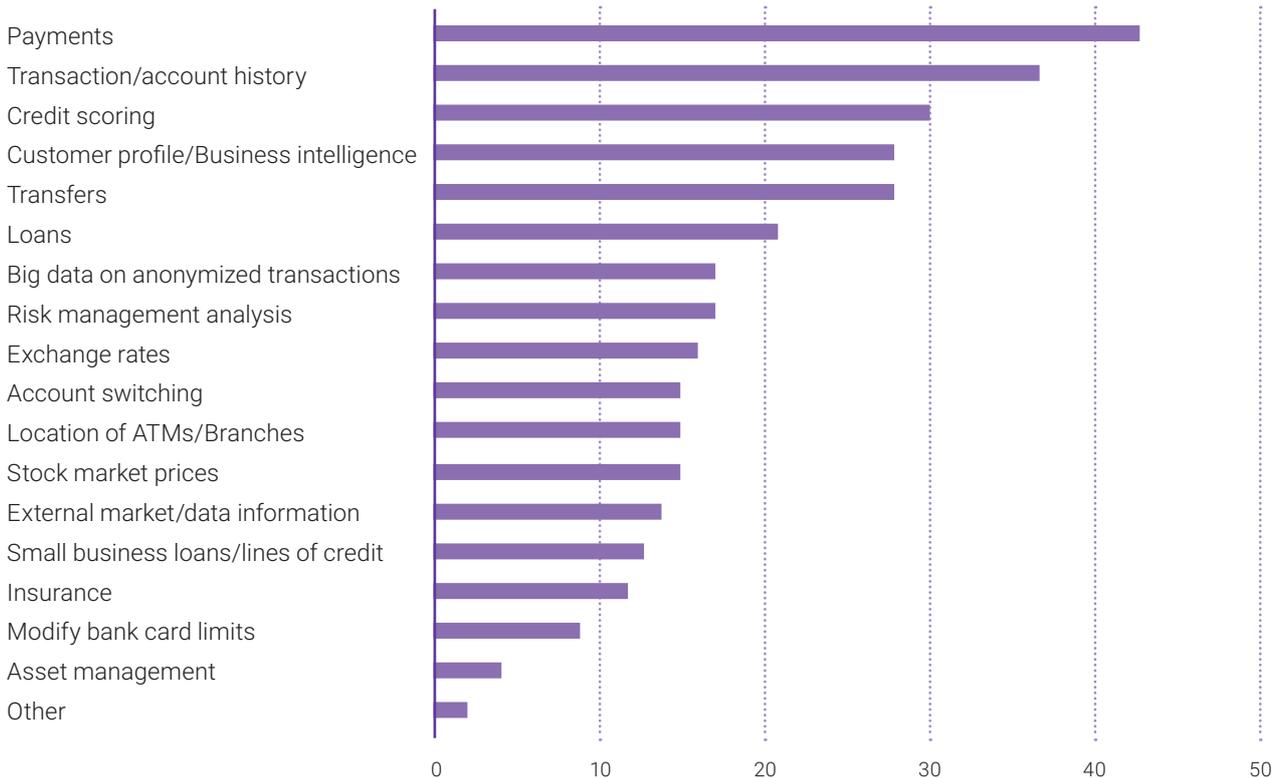
Expectations on new open APIs in next 3 years (N=64)



Doing proof of concepts for new open API products? (N=62)



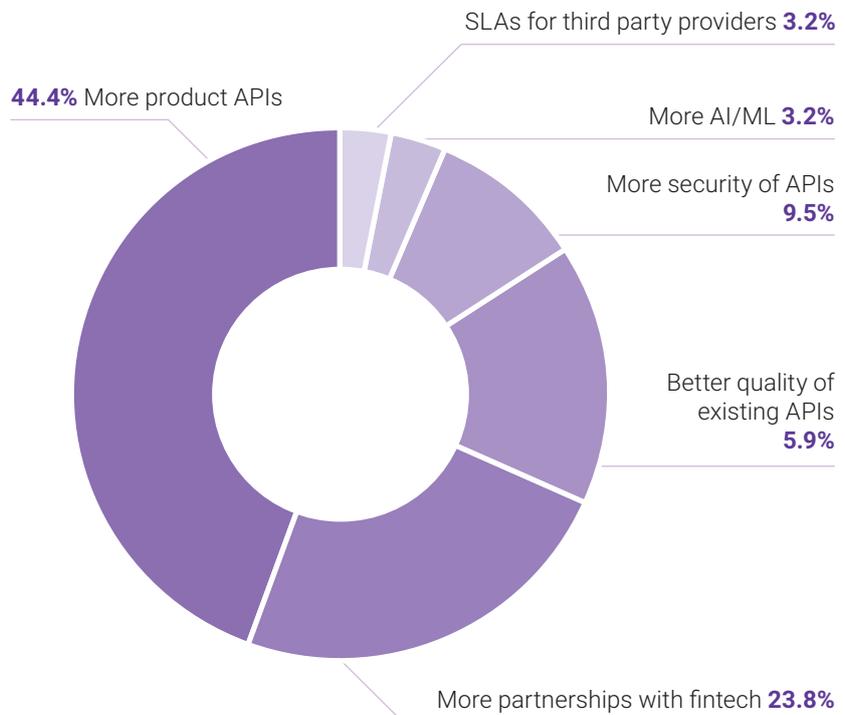
Open APIs with most potential for open banking (N=64)



Amongst survey respondents, payments APIs are still seen as having the greatest potential value for open banking (prioritized by 67% of respondents). Other product categories highly valued as having strong open banking potential included account information APIs (58%), credit scoring (47%), business intelligence and customer profiling (44%), transfers (44%) and loans (33%).

While the majority of survey respondents (44%) believed that banks should focus on more product APIs, almost a quarter of respondents felt better relationships with fintech should be a priority (24%) while 16% felt that the focus should be on improving existing open banking API products.

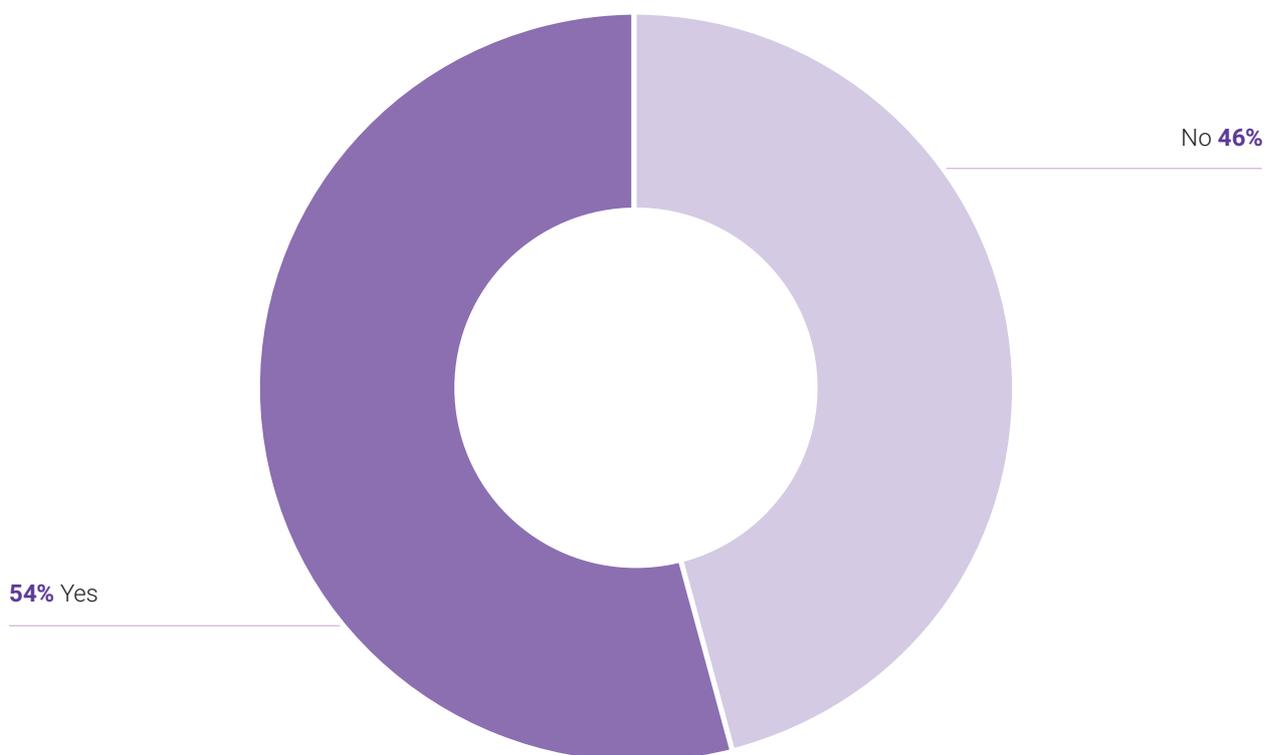
What do you think banks need to work on next? (N=63)



Developer engagement

Overall, banks are at the early stages of open banking platforms for external developers.

Do you have a public developer portal? (N=63)



Given the banking executive interviews and discussion of microservices orientation, it is perhaps unsurprising that just over half of all survey respondents (54%) have advanced sufficiently to offer an open API developer portal. Often the talk of open banking platforms suggests that progress is much further ahead than is currently the case. While many banks are investigating opening APIs, it is still very much early days for the majority. Even some of the most advanced API platforms only make APIs available in sandbox testing environments. Those that are ready to onboard third parties often move those third party developers into more traditional partner arrangements.

Banks are yet to build common pricing and business models for their APIs and pricing is often discussed privately with partners as their individual production level access is granted. "We are testing business models, but it is not about the pricing model itself, it is more about which frictions in the market could we get rid of, and how much would that be worth," said one banking executive. "We are using design thinking processes with potential retail customers. And it is the same with corporate: what are the frictions their customers have, where can we help them improve, and what it is worth to them?" Another said: "APIs are bringing in a lot of industry fragmentation. We need to build new business models, but that is a shift that will take awhile." A third banking executive agreed: "Really, we are not at the point of validating the model for pricing. At the moment, the APIs we are working with are mostly for private, internal use."

Conclusion

This year's research, survey and interviews with banking executives all demonstrate that banks are beginning to take up the open banking opportunity.

2018 has seen a 73% growth rate in the number of open banking platforms worldwide, with the Asia Pacific region being one of the fastest growing regions. There are several geographic differences in the uptake of APIs: In Europe, payments and accounts information APIs (required under PSD2 regulation) are the main product categories, while in the U.S. and Canada, account information APIs are the most common, as banks strive to find more secure ways to allow their customers to use account information software without the risk of data scraping.

Regulation and technical modernization programs are still at the forefront for why APIs are being introduced; but as new technology falls into place, lines of business are beginning to take ownership and consider the implications of opening banks as new ecosystems. However, there still seems a lack of strategy to guide banks in managing experiments and ecosystem rollouts. A Strategy-with-APIs and RISK approach can help banks test and build out ecosystems more methodically, learning from lessons as they go.

Key to enabling open banking platforms, many banks have decided on internal governance processes and are putting into place processes to speed up and standardize internal API creation. New technologies and security systems are being tested with many moving from proof of concept to implementation.

Now, the main challenge remains as ever: the regulatory environment is supportive. The technology is in place. Lines of business are on board. There is a fertile ground of third party providers to partner with, and customers are demanding new experiences and a wider range of digital and mobile products. But the key question is the same as in previous years: do banks have the stamina and willingness to take up the open banking opportunity?

Research Methodology and Survey Sample

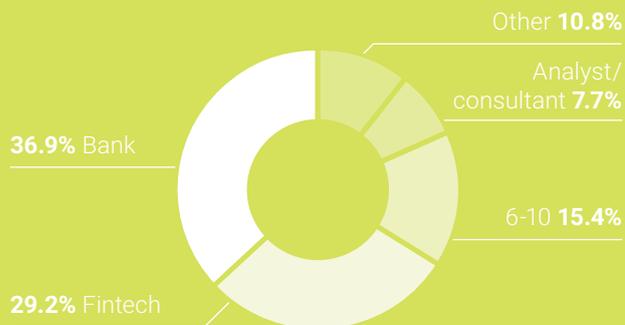
The *Banking APIs: State of the Market* report is compiled from an ongoing analysis of available open banking platforms around the globe. Regular alerts are set up to track announcements of new open banking APIs, and we regularly receive press releases from industry stakeholders alerting us to new developer portals being hosted by banks. Data is tracked in our State of the Market database, and platforms and products are tallied regularly.

We conduct interviews with 20 banking executives from around the globe who share their insights with us on the condition that no identifiable details are included. All quotes are checked with the interviewees to confirm that they are comfortable that quotes cannot identify any specific banks strategy.

This year, we targeted former readers of State of the Market Reports and API Days conference attendees to complete an in-depth survey on banking trends. 66 respondents completed the survey. 37% of survey respondents worked in a bank, while 29% worked in fintech and 15% worked in closely related industries. Half of the survey respondents came from technical backgrounds, with 31% coming from business innovation or product management roles.

Respondents were based in Europe, UK, Australia, U.S., Canada, the Middle East, India, Brazil, Canada and South Africa.

Survey respondents place of work (N=66)



Work role of survey respondent (N=62)



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