



**Opening banking through
architecture re-engineering**
A microservices-based roadmap

The banking industry has been experiencing a seismic shift towards digitization over the past several years, bringing the banking experience and operating model closer to that of other industries and consumer expectations than ever before. Banks, now with a more mature digital foundation, are entering the next frontier of a more open and marketplace-based approach to offering and distributing products and services to their customers. This new frontier will likely be opened breached by platform banking, a technology-enabled fusion of traditional and digital banking, fintech, and third parties. Platform banking flips the traditional banking model into a customer-centric one that offers a marketplace of financial products and services sourced from multiple and independent institutions.

This paper provides an overview of platform banking and a microservices-enabled technology roadmap to launch platform banking. A microservices architecture (MSA) is a foundational

component that helps banks to realize the role that they desire to play in platform banking ecosystem. The technology roadmap outlines key components of the MSA and how banks can build and deploy these components in a phased deliberate manner to be able to exploit new opportunities while minimizing transformation risk.

Before diving deeper into how platform banking can transform banking business models, it is important to understand the distinction between open banking and platform banking. A recently published paper by Deloitte, "[Executing the open banking strategy in the United States](#),"ⁱⁱ provides a definition of open banking vs. platform banking. Additionally, the paper captures key customer preference trends that are driving the industry towards open banking.

Open banking versus platform banking: What they are and how they're different

Open banking is when a bank, upon a customer's request, shares customer data with third parties via APIs.ⁱ Open banking does not use other, less secure methods of data-sharing, such as screen scraping, CSVⁱⁱⁱ files, or OCR^{iv}-readable statements. There are two types of open APIs: read access, which only gives access to account information, and write access, which enables payments. Open banking can be mandated through government regulations, as it is in the United Kingdom and European Union Second Payment Services Directive (PSD2), or its adoption can be industry-driven, as in the case now in the United States. Open banking is built upon the premise that customers own the data they generate and have the right to direct banks to share their data with others they trust. While it was designed to give customers more choice, open banking may end up making customers better understand and appreciate the value of one of their key assets: their data.

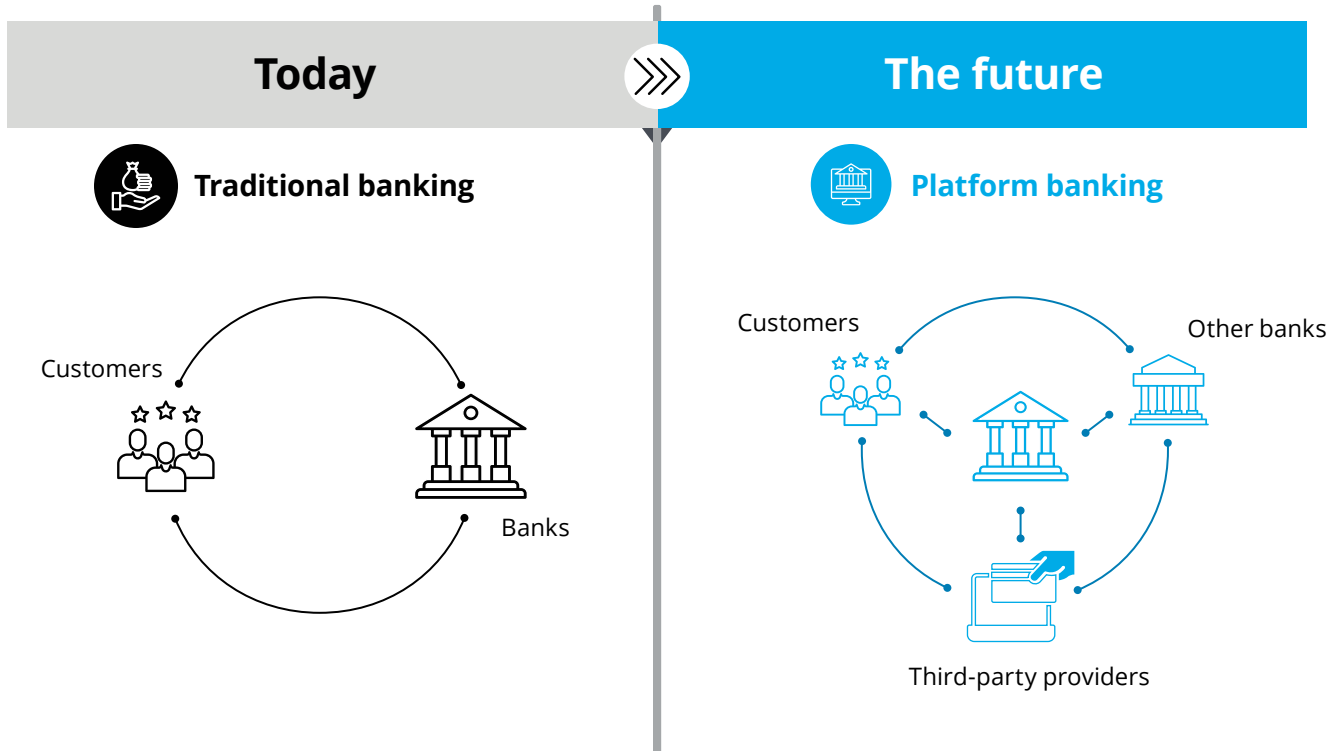


Platform banking, in contrast, is a digital marketplace, owned and operated by a bank or another third party, that provides banking and nonbanking services. As with open banking, sharing of customer data happens only with customer's consent. Moreover, platform banking also requires secure data transmission via APIs. The premise behind platform banking is that banks can serve customers better, engender more trust, and retain the customer relationship. Open banking enables and amplifies platform banking.

As described above, platform banking helps banks to better serve their customers by offering a suite of banking products and services in a marketplace model, where an existing customer can pick and choose products offered by different financial institutions. Platform banking may, in fact, be poised to change banking as dramatically as

other digital trends has over the past decade. Figure 1 below depicts how the relationship between a customer and their bank transforms from a one-to-one relationship to a one-to-many relationship enabled by the lead bank.









Figure 1. Traditional banking vs. platform banking



A host of factors and trends are driving banking towards platform banking. Globally, regulators have been on the forefront of change; for example, the European Union introduced the Second Payment Services Directive (PSD2), leading to a disruption of the payments landscape. In the United States, though a regulatory push is not on the horizon, emerging market forces, such as declining profitability, a desire to find new revenue sources, and the entrance of “big tech” into financial services, are making a case for platform banking. In order to prepare and exploit opportunities presented by platform

banking, banks will have to review near-term and long-term business goals and determine the optimal platform banking strategy. Banks will gravitate, based on their business, organizational, and technology maturity and goals, toward one of the three platform strategies: marketplace owner, marketplace partner, and utility provider. Each strategy requires varying degrees of investment and will have varying degrees of transformative impact, as described in figure 2.

Figure 2. Platform banking models and transformation scale

	 Marketplace owner	 Marketplace partner	 Utility provider
 Definition	Build an ecosystem of partners, fintechs, and other banks through marketplace interface to offer both homegrown and external products	Rationalize current product and service offerings and partner with a marketplace provider to offer select few products and services but relinquish distribution to third-party banks	Relinquish ownership of products and distribution to operate as a utility, and providing other players with infrastructure and non-customer-facing services
 Strategy	Directly offer products/services that are differentiated or financially lucrative, while offering best-in-class and/or commoditized third-party products	Develop niche products and utilize marketplace provider to break into underserved and new customer segments	Focus on services that meet the middle and back office operational and technology infrastructure needs of other players
 Business	Significant transformation as the bank scales distribution models, markets new products, and generates revenue through new models <i>Focus on core services–marketplace to fill gaps and broaden offerings</i>	Medium-to-high transformation as the bank rationalizes product portfolio and relinquishes distribution channels <i>Align and adhere to marketplace processes and SLAs to service</i>	Low transformation as the bank ceases to be a bank by relinquishing distribution channels and customer facing products <i>Provide low-cost utility services such as AML/KYC checks and payments</i>
 Technology	High transformation as the bank enhances technology stack to integrate with diverse parties and scale to meet additional volumes <i>Establish marketplace infrastructure to support third parties to launch their products</i>	Low to medium level transformation as bank reduces technology footprint while modernizing to enable seamless integration <i>Deploy architecture enhancements to release product-specific APIs to third parties</i>	Medium level transformation as bank substantially reduces app. Stack while increasing infra. footprint to support volumes <i>Decommission technology stacks that are supporting now defunct products and channels</i>
 Organization	Medium to high transformation to functions such as procurement, sourcing, and risk as bank identifies and onboard new parties <i>Deploy ecosystem compliant application, data, and infrastructure processes such as DevOps</i>	Medium level transformation as bank reduces distribution channel footprint and rationalizes product portfolio <i>Enhanced investment in risk, compliance, and regulation organizations</i>	Low transformation as bank substantially reduces operations around distribution channels and products <i>Train existing business, operations, and technology teams to support external partners</i>



Banks may be best served to pursue either a marketplace owner or marketplace partner role in the new ecosystem; becoming a utility provider is unlikely to be a viable business model, as it relegates banks to a mere service provider with low margins and no control over the customer relationship.

Assuming a role to a marketplace owner or marketplace partner role requires significant investment, with the degree of investment being higher for marketplace owner than for marketplace partner. As a

marketplace owner, banks will incur additional risk, compliance, and infrastructure costs to ensure integrity, security, and scalability of the marketplace. Banks’ ability to pursue one of these options depends on their appetite to transform, their strategic goals, and the constraints imposed by their current position in the banking ecosystem.

Microservices-based architecture: Foundation for platform banking

For most banks, successful adoption of platform banking standards will require substantial reengineering of current core banking application architecture and infrastructure. It will also call for an enterprise-wide transition toward microservices-based architecture, which is a critical enabler that allows efficient and accelerated integration with third parties, which can become the chief competitive differentiator in the platform banking ecosystem.

The current core banking architecture of a bank will have a significant bearing on the approach and level of technology transformation required to support either of the platform banking business models. While banks with legacy core banking architectures, monolithic applications with multiple point-to-point integrations and batch processing, can transform in a phased manner, while minimizing risk, through a deliberate approach with near-term and long-term objectives. Whereas banks with modern cores, typically with service-oriented and mature API-based architectures, can transform through a big-bank approach owing to their mature IT organizations.

Figures 3A and 3B illustrate a microservices-based conceptual architecture, along with the three key components, namely 1. API Gateway, 2. Service mesh, and 3. Microservices-based core, that banks need to deploy to be able to build and sustain an ecosystem of external partners. These three components are foundational for platform banking that will enable banks to integrate and provide access to third parties with open standards, data security, and scalability.

Microservices-based architecture

In microservices-based architecture, or MSA, applications are built as a suite of services, each running its own processes and communications. Each service can be built, updated, and managed independently, making microservices-based applications easier to maintain and enhance.

Microservices have become mature, stable, and scalable over the past three to five years. In other industries, notably ridesharing and streaming media services, leading players have replaced monolithic application architectures with MSA.

When deployed properly, MSA can be an ideal platform, as it allows banks to build and scale and integrate seamlessly with partners for platform banking.

Figure 3A. Microservices-based architecture (representative)

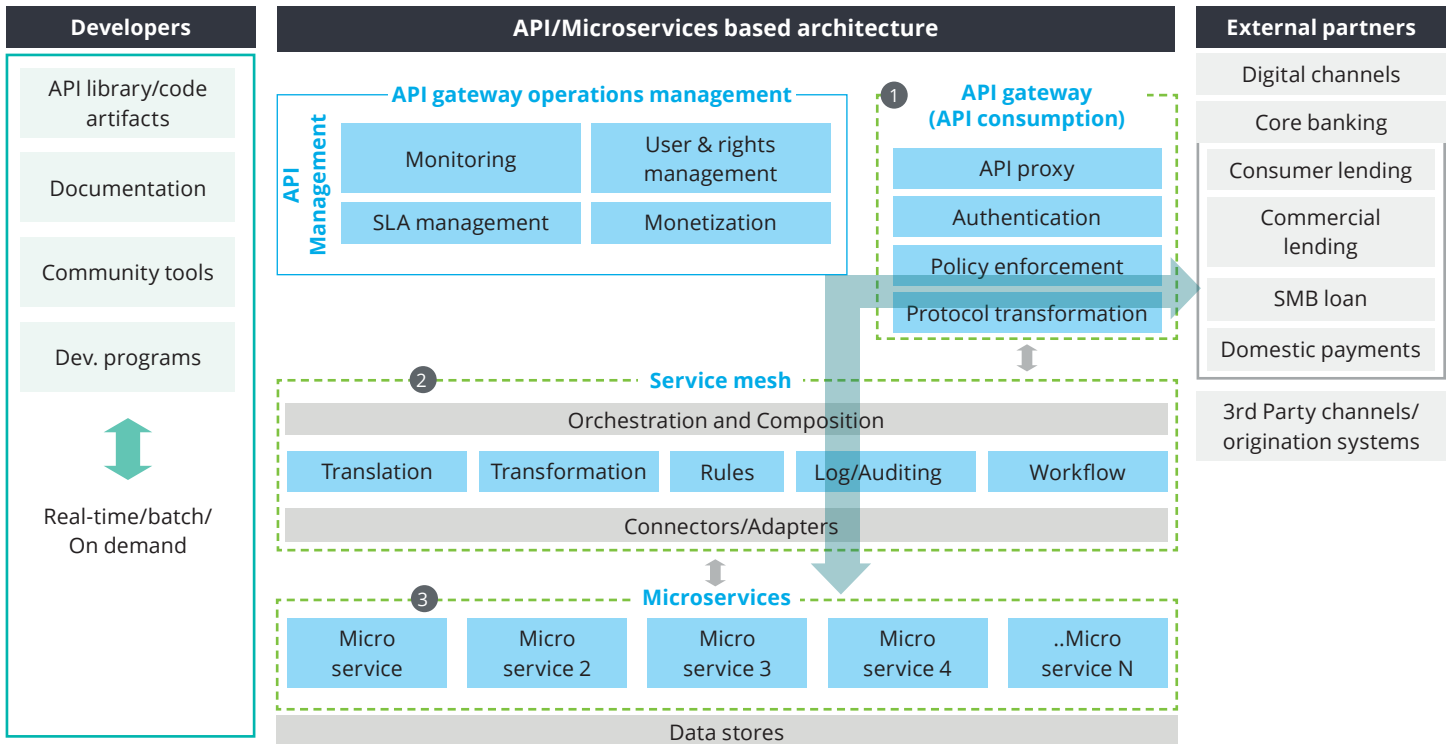
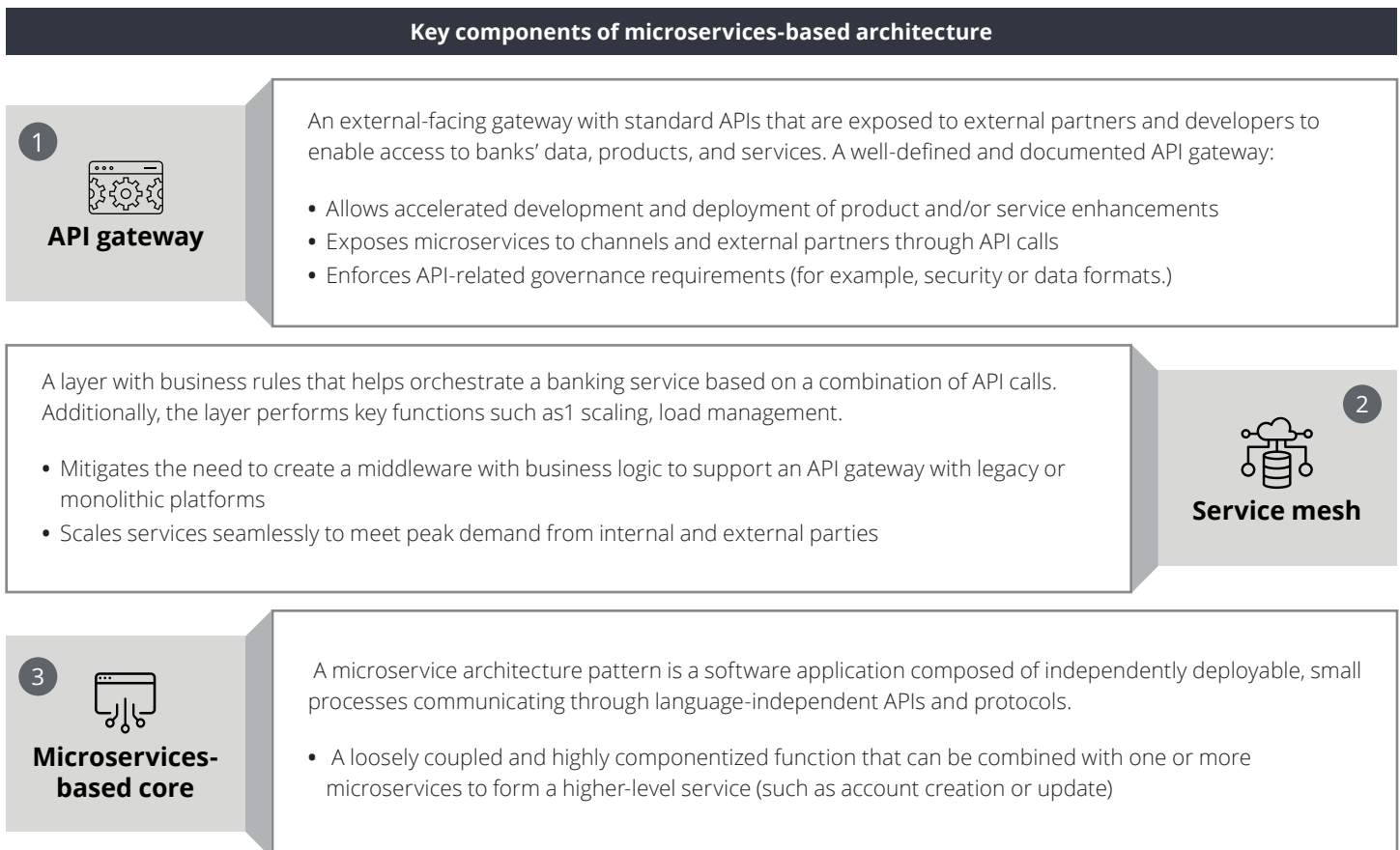


Figure 3B. Key components of microservices-based architecture



Embarking on the platform banking journey

As is the case with large-scale technology transformation initiatives, transitioning to a true microservices-based architecture requires significant investment, both in terms of resources and time. The journey to platform banking and a microservices-based architecture

requires banks to determine business and product strategy and technology readiness. Figure 4 illustrates a two-step process to help banks define the right journey for them.

Figure 4. Business, organization, and technology readiness process

Step 1: Align on business model and product roadmap

Business model: Assess the strategic goals of the organization and determine whether the bank wants to build a Marketplace or be a partner.

Product & services roadmap: Develop a near-term and long-term view of products and services that will be offered in-house and sourced from external partners and FinTechs.

Step 2: Assess application and technology infrastructure

Core banking platform: Assess the ability and the investment required to scale, launch new products, and support external integration.

DevOps capabilities: Determine IT Organization's readiness to launch and sustain new products, enhancements, and patches through DevOps processes such as Continuous Development and Continuous Integration.

Developer ecosystem: Assess the processes to engage developer community and onboard new developers to support product goals.

Cloud compatibility: Determine the investment required to transition from on-prem infrastructure to a private/public hosted deployment

Based on the business model, product and services roadmap, and technology readiness, banks can initiate their platform banking journey through a phased approach with near-term and long-term goals. Banks with an aggressive product roadmap, mature application architecture, and scalable technology infrastructure can fast-forward to a long-term goal of standing up a microservices-based architecture in a big-bang fashion. As is the norm, big-bang transformations are fraught with significant risks; however, a robust assessment of overall readiness should provide enough organizational intelligence to determine whether a bank's business and technology organizations can transition to microservices-based

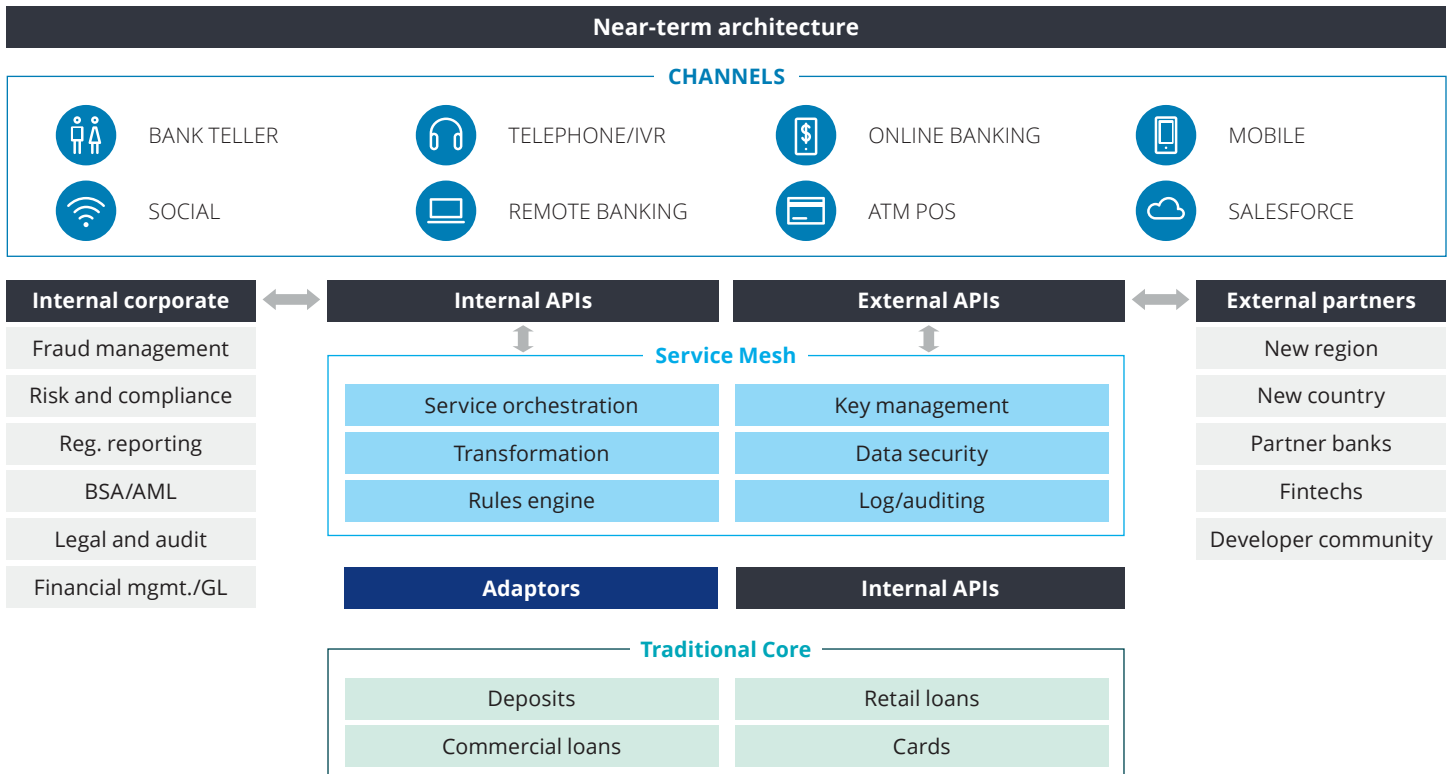
architecture in a big-bang fashion. Banks encumbered with legacy business or technology constraints should take a more phased approach to transformation, with clearly defined near-term and long-term goals. A phased approach to build a microservices architecture will mitigate risks while providing banks an opportunity to start building a marketplace and offer products and services to customers in the immediate future. Figure 5 below provides an architectural view of near-term and long-term objectives that banks can target and start building platform banking ecosystems.

Near-term: Deploy and integrate service mesh

In the near-term, banks with legacy core banking application architecture should prioritize building a service mesh to abstract underlying legacy platforms. A legacy core is not a limitation to support platform banking because a service mesh that can interact with legacy core through adaptors allows banks to move towards microservices-based architecture. Service mesh, as the name implies, is a set of services, along with product configuration and orchestration logic, will interface with core platforms and expose a set of APIs to both internal and external parties for accelerated integration. For example, service mesh would receive a service call, such as underwriting decision, and will make the necessary internal services, based on product configuration, such as “get credit score” and “get underwriting options”—these would be relayed back to internal or external parties.

A service mesh can minimize the number of endpoint integrations within the bank while providing a standard, well-defined, and documented interface to external platforms. In a way, service mesh acts as a gateway for external parties to connect and enables the “platform” feature of platform banking. As shown in figure 5, a combination of APIs and service mesh will help wrap a unified integration layer on traditional banking cores. The time to market for new products and services is still constrained by the underlying monolithic cores with longer development and deployment cycles. Banks may still face challenges scaling this architecture, as the entire core platform resides on infrastructure that doesn’t scale in real time. In the near term, banks can start offering their leading products and services on their own, and third-party marketplaces can stitch up partnerships with niche players in new markets to offer their products and services.

Figure 5. Near-term conceptual architecture



Long-term: Microservices-based core

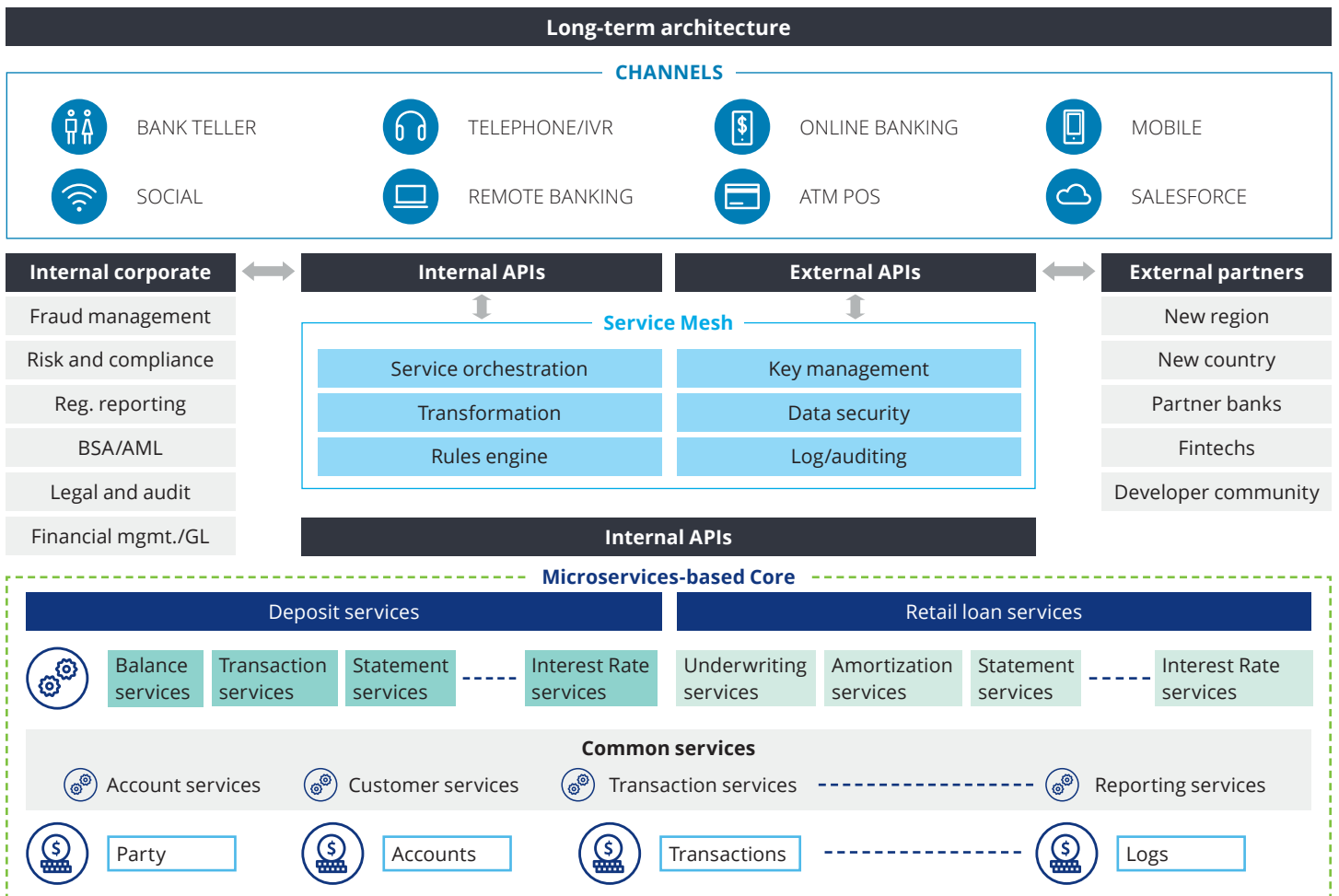
In the long-term, banks should move to a next-generation microservices-based core platform in coordination with service mesh. Banks with an ambition to build industry-leading marketplace should build a microservices-based platform that can offer and scale banking services as individual stacks categorized by product domains. Figure 6 depicts a representative microservices-based core architecture that can support a true platform banking-based ecosystem.

In this architecture, the core is a combination of services organized by product domains, such as deposits, retail loans, and commercial loans. In such an architecture, services can be broadly categorized into two types: product-specific services and common services. Product-specific services are those that are unique and tailored to support a specific product; as an example, underwriting services might vary and require unique services to support retail loans against commercial loans, as the underlying risk, terms, and offers might vary across loan portfolios. Common services are cross-product and can be product-agnostic. As an example, account

services would include basic services such as creating an account, updating an account, and getting account details. These services are fundamental to typical core banking platforms and wouldn't vary significantly across different products; only the underlying data would vary to meet a specific product's needs.

The goal of a microservices-based architecture is to help banks stitch together services from different parties to offer a unique service to customers. For example, a marketplace owner can combine industry-leading onboarding services from a fintech with in-house underwriting capabilities and book the receivables to a third-party bank—a customer availing a loan from the marketplace would be shielded from the handshakes occurring among various parties in the back end. Such a proposition can be executed effectively only with a microservices-based architecture—banks can attempt to offer similar products with near-term architecture—but they will be severely constrained due to architectural limits.

Figure 6. Long-term conceptual architecture



Conclusion: Banks should start their transition towards platform banking now

The path to platform banking, while challenging, offers banks the ability to create and enter new markets, and establish new business models to enable growth. Assuming a lead or active role in a platform banking world will not only create new sources of revenue, but also enhance customer experience and improve operational efficiency.

With platform banking a matter of 'when' and not 'if', banks need to get started today. The phased approach recommended in this paper, one that considers a bank's current technical environment and its desired future environment, allows banks to lay the groundwork in a manageable, yet meaningful, way.

End Notes

1. i "Executing the open banking strategy in the United States," Deloitte Insights, October 21, 2019.
2. ii Application programming interface.
3. iii Comma-separated values.
4. iv Optical character recognition.

Authors and Contributors

Kevin Laughridge - contributor

Principal
Deloitte Consulting LLP
klaughridge@deloitte.com

Ketan Bhole - author

Senior Manager
Deloitte Consulting LLP
kebhole@deloitte.com

Ram Nareddy - author

Manager
Deloitte Consulting LLP
rnareddy@deloitte.com

About Deloitte

Deloitte refers to one or more of Deloitte Touche Tohmatsu Limited, a UK private company limited by guarantee ("DTTL"), its network of member firms, and their related entities. DTTL and each of its member firms are legally separate and independent entities. DTTL (also referred to as "Deloitte Global") does not provide services to clients. In the United States, Deloitte refers to one or more of the US member firms of DTTL, their related entities that operate using the "Deloitte" name in the United States, and their respective affiliates. Certain services may not be available to attest clients under the rules and regulations of public accounting. Please see www.deloitte.com/about to learn more about our global network of member firms.

This publication contains general information only and Deloitte is not, by means of this publication, rendering accounting, business, financial, investment, legal, tax, or other professional advice or services. This publication is not a substitute for such professional advice or services, nor should it be used as a basis for any decision or action that may affect your business. Before making any decision or taking any action that may affect your business, you should consult a qualified professional adviser. Deloitte shall not be responsible for any loss sustained by any person who relies on this publication.