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EXECUTIVE SUMMARY

Digital banks, also known as virtual or online banks, have emerged over the past decade as a new type of bank to address the limitations of traditional banking. Essentially, digital banks leverage financial technology ("fintech") to offer core banking services such as deposits, loans, and transfers through online channels.

Over the past decade, the number and scale of digital banks worldwide have grown rapidly. The entry of new digital banks peaked around 2019. Since then, digital banks have continued to grow rapidly within the overall banking industry in terms of their customer base, asset size, revenue, and market share. This has been driven by improvements in key infrastructure such as cloud computing and mobile internet accessibility. The COVID-19 pandemic has also accelerated their growth. Furthermore, digital banks have played a significant role in promoting financial inclusion by providing banking services to underserved populations. This is particularly relevant in developing markets, where digital banks provide small-amount financial products conveniently and with reasonable fees to individuals and small businesses.

Digital banks began to emerge around the world between 2009 and 2014. Driven by fintech advancements and regulatory support, the early waves of their development took place in Europe and North America. Digital banks have also developed rapidly in Asia and South America thanks to large populations and strong demand from individuals and businesses with limited access to traditional banking services. The digital banking model has proven successful across various regions. Whether in developed or developing markets, digital banks have shown their unique value to the financial services industry. Notably, digital-native banks in Asia achieved profitability shortly after their establishment and have maintained robust growth and profitability, showing strong capabilities in technological innovation and commercial operation.

Leading digital banks worldwide have taken diverse paths in their development due to differences in market environments, resource endowments, and business strategies. However, in recent years, they have been considering similar ideas for their continued development, and each has made various efforts and explorations in this regard, including:

Improving profitability and building a sustainable business model: As digital banking
enters its second decade of development, the competition in commercialization is no
longer driven by the favor of capital markets. Instead, digital banks have entered a stage
where they can improve profitability by leveraging economies of scale. Digital banks
focusing on large-scale retail customers are continuously improving their technology and
operational capabilities for better profitability per customer. Meanwhile, those focusing
on niche markets are deepening their understanding of customer needs and risks to
further optimize their product offerings and risk management.



- Leveraging unique ecosystem resources: To improve existing business models, digital
 banks are increasingly focusing on resources within their ecosystem. Players that are
 deeply embedded in a particular ecosystem are exploring opportunities to further
 leverage ecosystem data to enable precise services and enhance customer credit profiles.
 At the same time, they are looking to create a seamless user experience that perfectly fits
 into different scenarios within the ecosystem.
- Diversifying business lines: Leading digital banks are exploring diversified business
 lines and revenue streams beyond their existing financial services. They are actively
 productizing their capabilities and intangible assets, such as technological capabilities,
 operational expertise, customer resources, and data assets. Current initiatives include
 offering technology solutions, Banking as a Service (BaaS), and non-financial services to
 end customers.
- Exploring multi-market coverage: Multi-market coverage is also a key strategic move
 for leading digital banks seeking sustained growth and secure positions. Following
 earlier global expansion efforts by a few pioneers, leading digital banks are now
 focusing on becoming regional champions. They aim to gradually increase their coverage
 in geographically closer markets, enhance economies of scale, and improve profitability.
- Participating in infrastructure development for seamless data element flow: Leading
 digital banks are also making efforts to support seamless data element flow. They
 are offering their capabilities in secure computing, privacy computing, and federated
 learning to other firms as open-source or productized solutions. This aims to address
 data silos, encourage data sharing, and maximize data value, all while ensuring data
 security and fairness.

As business models evolve and traditional banks' digital capabilities significantly improve, the boundaries between traditional and digital banks are gradually blurring. In the future, emerging technologies such as generative artificial intelligence (AI) and Web 3.0 will further stimulate the emergence of new forms of banks. Regardless of whether these will still be referred to as digital banks, they will continue to drive innovation and foster a more dynamic and customer-centric financial services industry.



CHAPTER 1

GLOBAL DIGITAL BANKING DEVELOPMENT OVERVIEW

Over the past decade, the number and scale of digital banks worldwide have grown rapidly, driven by improvements in key technological infrastructure, and accelerated by the COVID-19 pandemic's unique environment. With fintech advancements and regulatory support, digital banking initially developed in Europe and North America, but it has also developed rapidly in Asia and South America thanks to strong demand from underserved populations.



1.1. WHAT IS DIGITAL BANKING?

Over the past decade, with the rapid development of information technology (IT) and ensuing digital revolution, the traditional banking industry had to deal with many challenges. Complex processes, long waiting times, and traditional products and services were no longer meeting diverse customer needs. As a result, new financial institutions leveraging fintech and online services began to appear in many parts of the world. These institutions are known by various names in different places, such as "virtual banks," "online banks," or "challenger banks."

These institutions commonly leverage fintech to offer core banking services, namely, deposits, loans, and transfers, primarily through online channels. As they serve as a complement and extension to the existing banking industry, it is difficult to strictly define them, and in turn challenging to consistently determine the number and scale of their operations.

This report collectively refers to the aforementioned financial institutions as "digital banks." In terms of qualitative research, the report covers the overall development trends of these financial institutions. However, for the sake of data consistency and comparability in case selection, the term "digital banks" in the following sections primarily refers to licensed financial institutions that leverage fintech solutions to provide core banking services, such as deposits, loans, and transfers, primarily online, with an independent corporate entity.

1.2. HOW DID DIGITAL BANKS RISE?

Over the past decade, the number of digital banks has increased significantly, reflecting the rapid development of this emerging business model in financial services.

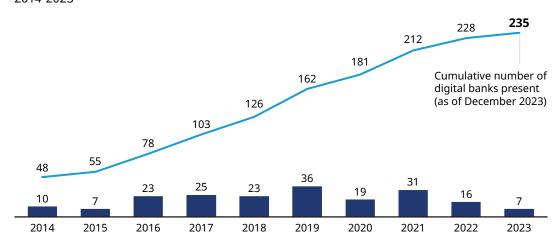
Europe saw the establishment of the earliest digital banks. Between 2010 and 2015, a number of digital banks appeared there, including Monzo, OakNorth, Starling Bank, N26, and Revolut, attracting hundreds of millions of customers since their inception. At the same time, similar challenger banks and fintech companies that provide banking services began to appear in markets such as North America, Asia, and South America. Subsequently, the number of digital banks worldwide increased significantly. By 2023, the total number of licensed digital banks globally had reached 235, while the number of players offering broader digital banking services had already exceeded 300.

These digital banks have diverse origins, with some being developed from fintech companies, others curated by incumbent financial services groups, and even others being greenfield entities built from scratch. Due to their different origins, they can be broadly categorized into digital-native banks and transformed digital banks. Digital-native banks, such as WeBank and Nubank, are typically newly established banks or fintech companies



that focus on online services and use financial technology to provide online financial services in markets where traditional banking services are underdeveloped or to customers who have limited access to traditional banking services. On the other hand, transformed digital banks, such as BBVA and ING, derive from traditional banks and use fintech to transform existing banking operations, innovate products and services, improve customer experiences, and reduce operational costs, all while increasing efficiency.

Exhibit 1: Number of licensed digital banks worldwide 2014-2023



Number of new digital banks launched annually worldwide

- Cumulative number of digital banks present

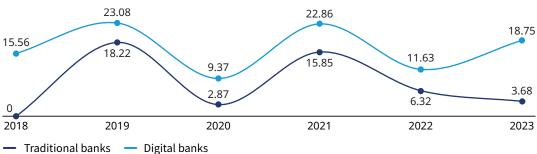
Note: Only includes institutions that have obtained banking licenses from national regulatory authorities or have special "virtual bank" licenses.

Source: The respective financial regulators of various countries and regions

The development of digital banks is reflected in not only their increasing numbers but also their growing share within the overall banking industry. The net interest income (NII) growth rate for digital banks is significantly greater than that of traditional banks, and we also see similar trends in the overall revenue and asset scale of digital banks.

Exhibit 2: Comparison of NII growth rates between global digital banks and traditional banks





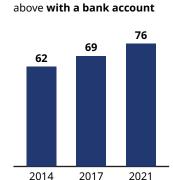
Source: Statista Market Insights, World Bank

This rapid development is partly due to the favorable environment. Key infrastructure, such as distributed cloud computing and mobile internet accessibility, has gradually improved worldwide, providing strong technical support for digital banks, enabling them to rapidly expand their businesses globally. The COVID-19 pandemic also objectively accelerated the development of digital banking services. During the pandemic, there was a significant increase in the use of digital banks due to the disruption of in-person banking services. This is because digital banks can ensure business continuity by providing remote and contactless services, including credit risk assessment. The pandemic also significantly increased the use of digital payments, further accelerating the behavior changes in personal consumption and how people access financial services, making consumers much more comfortable with the digital banking model.

At the same time, the convenient and streamlined business model of digital banks is well-suited to financial inclusion. Operating primarily online and with a streamlined cost structure, digital banks can reach populations that may not have easy access to traditional banking services, especially in regions where traditional banking is underdeveloped. The emergence of digital banks has enabled some individuals to open bank accounts or receive funding through personal loans for the first time. For small and medium enterprises (SMEs), digital banks are able to offer small, convenient, and reasonably priced products and services based on relatively simple procedures, giving access to more effective financial support. Therefore, driven by the strong demand for inclusive finance, digital banks have experienced rapid development. Since the inception of digital banking, global financial inclusion indicators have indeed improved.

Exhibit 3: Improvement of global financial inclusion indicators

2014-2021, %



Global population aged 15 and

and above using electronic payments

64

44

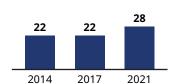
2014

2017

2021

Global population aged 15

Global population aged 15 and above with access to credit



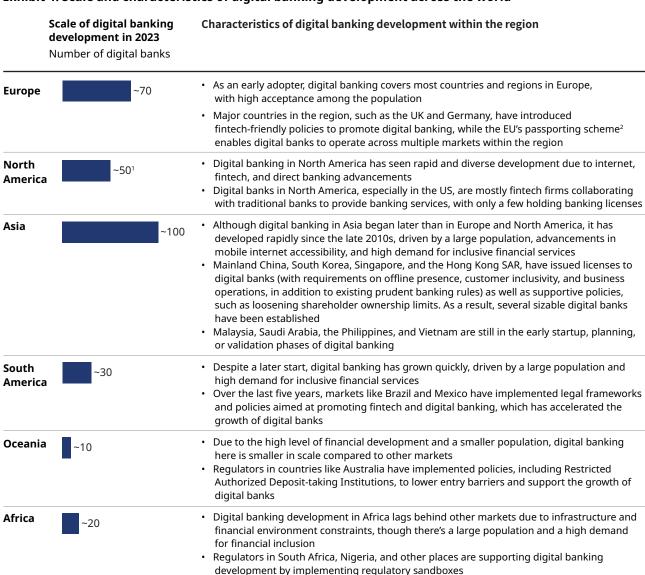
Source: World Bank



1.3. HOW HAS DIGITAL BANKING DEVELOPMENT VARIED ACROSS REGIONS?

Between 2009 and 2014, digital banks appeared in major regions around the world. However, due to the unique characteristics of each market, the development strategies of these banks varied.

Exhibit 4: Scale and characteristics of digital banking development across the world



^{1.} The data in the US market includes digital banks that hold banking licenses, as well as digital banks that do not hold banking licenses but operate banking services in collaboration with licensed traditional banks.

Source: Statista, and the websites of the central banks and financial regulators of various countries and regions

ABWASIA.ORG

^{2.} Digital banks that have obtained the full banking license from their home country can provide banking services to all countries within the European Economic Area (EEA).

Overall, the digital banking model has been proven to thrive in major markets, and it also shows that digital banks, through technological and business model innovations, have a strong ability to adapt in both developed and developing markets. In developed markets, they serve long-tail customers and SMEs that traditional banks cannot fully cover. In developing markets, they meet the retail and microfinance needs of large populations.

However, judging from the dates of establishment and growth speeds of digital banks in different regions, the rapid development of digital banks within a given region still requires conducive conditions. These include infrastructure such as mobile internet accessibility and cloud computing, as well as the availability of technical and operational talent. Regulators also play a supportive role by launching policies that are positive for digital banks or by providing regulatory sandboxes for innovative businesses, helping digital banks within the region grow quickly. In markets where the traditional banking system is highly centralized and banking services are relatively expensive, intentional regulatory moves can accelerate the development of digital banks.

REGULATORY ENVIRONMENT: DIFFERENCES IN DIGITAL BANK REGULATION ACROSS MARKETS

The development drivers and market characteristics of various countries and regions determine their regulatory conditions. The different visions of regulators also lead to differences in how they manage digital banks.

- In traditional financial hubs such as the UK, Singapore, and the Hong Kong SAR, **financial regulators have proactively introduced policies to promote digital banking and fintech innovation**. They aim to use digital banking to capture the potentials of fintech innovation, improve the capabilities of their financial systems, and enhance their international financial influence. For example, in the UK, policymakers and regulatory bodies have implemented a series of supportive regulatory plans specifically for digital banks to revitalize the British banking sector. In 2015, the UK became the first country to put a "regulatory sandbox" mechanism into operation, allowing regulators to assess the feasibility of financial products and business models in a controlled environment, thereby fostering innovation in products and services.
- In emerging or small economies such as Brazil and Indonesia, market demand has primarily driven digital banking development. There are large populations in these regions that are underserved by traditional financial services. Digital banks, with their easy access and user-friendly interfaces, are able to provide relevant and effective financial services to these groups at an affordable cost, enhancing financial inclusion in the respective regions. Furthermore, some customers in these regions have diverse and rapidly changing needs for financial products and services. Digital banks are able to use their flexible and innovative product and service design capabilities to fill the market gaps left by the existing banking system. Given the inclusive nature of digital banks, financial regulators in these regions support their development, while also prioritizing consumer rights protection and systemic risk prevention in the financial industry. They maintain a balanced regulatory approach between market demand and financial oversight, to satisfy market needs, encourage the development of digital banks, and protect the financial system.



With regard to licenses for digital banks, regulators mostly follow two approaches: **Using existing banking licenses or issuing specialized licenses for digital banks.** Some markets choose the former approach based on the principle of "substance over form," believing that the nature of digital banks is the same as traditional banks. They believe that applying the same regulatory framework can mitigate regulatory risks and ensure fairness. Other markets, however, choose the latter approach, aiming to encourage competition and promote innovation and development in the industry.

- Using existing banking licenses: Regulators in countries such as the US and the UK have not yet issued specialized licenses for digital banks. Instead, they regulate digital banks holding banking licenses according to the same standards as traditional banks. These regulators adhere to the principle of "substance over form," believing that digital banks and traditional banks do the same type of business, only with differences in their marketing channels. Therefore, they apply the same set of regulations to avoid regulatory arbitrage that could arise from inconsistent rules for online and offline operations. However, some markets provide more flexibility and convenience for digital banks within legal and regulatory frameworks to promote innovation. For example, the UK encourages fintech companies holding certain financial licenses, such as payment licenses, to apply for banking licenses, enabling them to offer full-fledged digital banking services. In the US, fintech companies are allowed to launch digital banking services by partnering with licensed banks, which broadens the opportunities for them to innovate their services.
- Issuing specialized digital bank licenses: Meanwhile, regulators in markets such as Singapore, the Hong Kong SAR, the Philippines, and Malaysia issue specialized licenses for digital banks for digital banking operations, such as the virtual bank license in Hong Kong. These licenses typically require digital banks to meet the basic regulatory requirements for banks while also following specific requirements related to equity structure, channel strategy, and technological capabilities. By bringing in digital banks as market catalysts, regulators aim to transform the relatively stagnant competitive landscape of the local banking sector, encourage healthy competition, elevate the standards of the banking industry, and enhance the overall competence of the financial system.

LEADING DIGITAL BANKS: DIVERSIFIED DEVELOPMENT PATHS AND EXPLORATION OF COMMERCIAL SUSTAINABILITY

Today's digital banks are at various stages of development, depending on their type, date of establishment, market coverage, business model, and other factors. We have selected leading digital banks from major markets to see where they stand at present, focusing on those with both significant scale and relatively complete publicly disclosed data.



Exhibit 5: Business overview of leading licensed digital banks in major markets¹

Region	Digital banks	HQ base	Туре	Operational and profita timeline (since establis	bility hment)	Net profit scale²	Size of user base ²	Coverage ³	Busines	s focus
									Retail	SMEs
Europe	ING	Netherlands	Transforme	ed ₁₉₉₁	—	[]		Multi- market	~	~
	Tinkoff Bank	Russia	Native	2006 2009	•				~	~
	N26	Germany	Native	2013	•	Negative		Multi- market	✓	~
	Starling Bank	UK	Native	2014 202	1	I			~	~
	Revolut	UK	Native	2015 202	1	1		Multi- market	~	~
Americas	Axos Bank	US	Transforme	ed 2000	•				~	~
	Ally Bank	US	Transforme	ed 2009	•		I		~	~
	Tangerine	Canada	Transforme	ed 2012	•	1			✓	~
	Nubank	Brazil	Native	2013 202	1			Multi- market	✓	~
	C6 Bank	Brazil	Native	2018	•	Negative			~	~
Asia	WeBank	China	Native	2014 2016	•				~	~
	MYBank	China	Native	2015 2016	•					~
	Kakao Bank	South Korea	Native	2015 2019	9				~	
	Mashreq NEO	UAE	Transforme	ed 2017	•	Negative			~	~
	Allo Bank	Indonesia	Transforme	ed 20	21				~	~
Africa	Kuda Bank	Nigeria	Native	2016	-	Negative		Multi- market	~	~
	Tyme Bank	South Africa	Native	2019	•	Negative		Multi- market	~	~

^{1.} This exhibit shows a selection of digital banks with banking licenses from major markets in Europe, the Americas, Asia, and Africa, focusing on those with relatively complete publicly disclosed data. Within each continent, the digital banks chosen are the most representative and significant in terms of business scale, such as revenue and number of users, in major markets, including countries, regions, and economic entities. The banks within each continent are ordered by their respective dates of establishment.

Source: Public information from annual reports, official websites of various digital banks



^{2.} The scale of net profit and user base is based on the most recent information disclosed by the banks, being from 2022 to 2023. The exhibit only represents the relative proportions of profit among the leading digital banks. The user base includes both retail and corporate customers. Please note that ING only discloses financial information at the group level, and the scale of its digital bank's net profit is for illustrative purposes only.

^{3.} Market coverage is divided based on administrative regions, and a market composed primarily of a single country or region is referred to as a single market.

Many leading digital banks in different parts of the world have passed the startup phase and achieved remarkable success in terms of user base and business scale and a significant proportion of them have already become profitable. This shows that, as commercial entities, digital banks are continually proving their commercial value and long-term operational capabilities.

Currently, leading digital banks are following diverse development paths, which may be driven by variations in market environments and their resource endowments. The business scale and customer base of any respective leading digital bank is highly correlated to its market environment. For example, digital banks in China, which leverage a large population base and a developed mobile internet infrastructure, lead the world in the number of customers served. In contrast, some digital banks in Europe and the Americas focus on niche markets, covering fewer customers but with better profitability. Although digital-native banks account for a significant proportion of leading digital banks, transformed digital banks, with support from their parent banks, have shortened their investment cycles and perform well in terms of profitability. Some digital banks that rely on existing ecosystems have already become among the most profitable digital banks, such as those that utilize vast amounts of data from the ecosystem. Notably, digital-native banks in Asia have achieved profitability within a relatively short period after their establishment and have maintained strong business growth and profitability. This shows that they have built robust technological innovation and operational capabilities. Currently, this advantage has been proven and consolidated in their respective single markets. In the future, digital-native banks in Asia may further use their established advantages in a bid for multi-market coverage.

Shifting from a macro to a micro perspective, what are the considerations and innovative practices of these leading digital banks in their long-term strategic choices and current business decisions? We will elaborate on these points in the next chapter.



CHAPTER 2

LEADING DIGITAL BANKING PRACTICES

In recent years, leading digital banks around the world have been contemplating the following five themes: Building a sustainable business model, leveraging unique ecosystem resources, having diversified revenue streams, establishing multi-market coverage, and optimizing the technology and data infrastructure.



2.1. WHAT ARE LEADING DIGITAL BANKS THINKING ABOUT?

Beyond the differences in performance figures, we have seen that leading digital banks across various parts of the world are contemplating similar issues, including:

A. How can they build a sustainable business model?

This is a question that almost all digital banks think about. Many digital banks have passed their startup phase and have developed stronger long-term operational capabilities. The commercial sustainability and profitability have become crucial for their survival and growth. At the same time, there is an industry-wide exploration of whether there are one or several successful business models. For example, can focusing on serving retail customers and focusing on serving SMEs both lead to success? Moreover, do digital banks need to have a certain scale to leverage the advantage of low costs?

B. Are they fully leveraging their ecosystems?

After years of development, digital banks today are more or less integrated into one or several ecosystems, either driven by their shareholder backgrounds or shaped by customer needs during their development. Digital banks rely on ecosystems to attract customers and enhance the customer experience. However, it is worth considering whether they have fully leveraged these ecosystems. Specifically, are there further potentials for the development and use of the settings, data, and partners within these ecosystems?

C. Are there other businesses and revenue streams besides the existing business model?

Besides the existing revenue streams, such as interest margins or fees and service charges, do digital banks have other business models for making a profit? Many digital-native banks that originated from fintech companies have developed capabilities in technology, data, operations, and non-financial services after achieving large-scale operations. Are there other ways in which digital banks can diversify their revenue sources?

D. Beyond their local markets, can they expand into other ones?

In addition to deepening their presence in a single market, digital banks have the opportunity to expand into other markets to increase their scale, user base, and business opportunities. During multi-market expansions, digital banks need to consider the following questions: Firstly, besides meeting the different regulatory requirements, what kind of external environment is needed for multi-market development? Moreover, is there an optimal time for entering other markets? Next, what are the challenges with regard to infrastructure, organizational structure, products, and operations for digital banks going overseas? Finally, can digital banks successfully localize their presence when they expand into other markets?

E. Apart from the digital banking business itself, what else can be done in terms of technology and data infrastructure to drive overall advancement?

The core elements driving the growth and operations of digital banks are technology and data. Therefore, digital banks are well-positioned to lead and innovate in these areas, while also bearing troubleshooting responsibilities. In fact, many leading digital banks have been actively promoting innovation in these areas. However, can the practices and technological solutions of digital banks help address common issues, such as data silos, trust gaps, and data security?

2.2. WHAT ARE LEADING DIGITAL BANKS DOING?

A. Enhancing profitability and building a sustainable business model

Many leading digital banks have already become profitable, and some have maintained high levels of profitability for several consecutive years. Although their development paths vary, we can see some common experiences. For example, retail-focused digital banks need to have a certain number of users before they can become profitable. Leading digital banks in Asia and South America, such as WeBank and Nubank, benefit from large local markets, leveraging economies of scale and technology to improve operational efficiency, resulting in strong profitability. In contrast, many digital banks in Europe have to deal with the smaller population sizes in single markets and slower customer acquisition rates compared to those in Asia and South America. As a result, it takes them longer to reach profitability. For example, N26, founded in 2013, is expected to reach profitability for the first time in 2024. In more developed financial markets, some digital banks reach good levels of profitability more quickly by serving specific niche customer groups or sectors. For example, OakNorth focuses on serving SMEs while Ally Bank specializes in the auto finance sector. These banks have successfully stood out in competitive markets by deeply understanding their specific customer groups or sectors and using specialized tools.



Currently, digital banks with commercial success primarily rely on NII as their main revenue source, mostly with either of two models. One is a retail-driven model that relies on markets with large population sizes. The other is a high-yield niche market development model that focuses on markets with smaller population sizes. In the former, digital banks service a large population and primarily provide inclusive financial services to retail customers, including basic account services, deposits, and remittances. They generate revenue from the provision of retail lines of credit and fees, and they gradually offset the initial research and development (R&D) expenses, lower the cost per customer, and enhance profitability as their businesses scale up.

In the latter, digital banks concentrate on specific high-yield segments. This can be achieved through various customer segmentation approaches, such as financing SMEs of a particular type or industry. Additionally, they attract deposits by offering retail customers higher interest rates than traditional financial institutions. Some digital banks also adopt a business-to-business (B2B) approach to provide lines of credit, where the actual lending is done by their partners rather than themselves, reducing operational costs. These models enable digital banks to navigate different market environments, improve customer experience, and enhance operational efficiency through innovation and technology.



WeBank (China)

WeBank leverages fintech innovation to reduce acquisition, operational, and risk costs.

As China's first digital-native bank, WeBank focuses on developing core capabilities around digital financial inclusion, leveraging new production factors such as advanced technology and data. It aims to achieve large scale, low cost, and high availability through in-house innovation.

Net profit

US\$1.49 billion

net profit in 2023

IT cost

~US\$0.3

IT operation and maintenance cost per account, less than 10% of that of peers

Customers

400 million

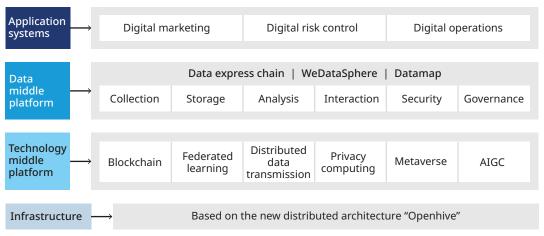
cumulative retail customers

4.5 million

cumulative MSME customers

As the number of customers increases over time, WeBank leverages its technological capabilities and operational efficiency to increase the economies of scale of its fintech. The annual IT operations and maintenance (O&M) cost per account at WeBank has gradually decreased from about US\$4.4 at its inception to about US\$0.3 in 2022, giving it a significant advantage in per-customer cost. All these achievements are made possible by its fintech capabilities:

- **Infrastructure:** WeBank builds its core banking systems on top of a distributed architecture ("Openhive"), where customers are placed into different clusters. This enables the simultaneous deployment of more than 100 banking systems in multiple versions.
- **Technology and data middle platform:** WeBank creates its own middle platform components in several advanced technological domains, including privacy computing, federated learning, AI, and blockchain, designed to support operations with large scale, high availability, and low cost.
- Application systems: WeBank leverages its digital strengths across customer acquisition, product
 operations, and risk management, and uses different digital application systems, such as digital
 marketing, digital risk control, and digital operations, to reduce acquisition, service, and risk costs.



Source: WeBank, Oliver Wyman analysis

Oaknorth Bank (UK)

OakNorth Bank has developed big data risk management capabilities for SMEs. Becoming one of the first players to implement cloud-based architecture, it reached profitability quickly.

Net profit

US\$180 million

net profit in 2023

ROE

22%

ROE in 2023

- Profitable after 1 year of operation
- First UK digital bank to be profitable

Customers and coverage

2 million customers

- Financing services exclusively for SMEs
- Accounts, deposits, and investment services for individuals

Focusing on SME loans and real estate business: OakNorth aims to serve SMEs in their early stages with regular funding needs and no real estate to offer as collateral, by offering tailored loan packages with amounts from £250,000 to several million pounds. It also partners with other financial institutions to provide real estate-related credit services using a B2B approach, with profit margins higher than those for digital banks that mainly offer small loans and consumer loans.

Building an advanced AI platform for end-to-end risk assessment and monitoring: Through in-house technological R&D, OakNorth created its "ACORN" AI platform, which uses machine learning algorithms and financial models for internal and external data analysis to generate target companies' credit reports, peer comparisons, and decision-support reports, which serve as references for the lending committee's decisions. Additionally, the platform continuously tracks target companies' financial and operational data to promptly identify potential default risks and provide early warnings through industry benchmarking, thereby significantly reducing the risk of lending.

Early adoption of cloud-based systems to minimize operational costs: When founded in 2015, OakNorth used Amazon Web Services (AWS) to build its underlying IT infrastructure, making it among the first players in the UK to host its core banking systems on the cloud. This saves it the need to invest in or manage physical branches, as well as the associated human resources and management costs.

Source: Public information from annual reports, official websites, Oliver Wyman analysis



B. Utilizing the unique resources available within the ecosystem

Once a digital bank has built a large customer base, it should focus on developing and using the resources within its ecosystem to build its strengths. This includes the ecosystem in which the digital bank operates, such as being part of a specific "internet ecosystem" or deeply embedded within a particular industry chain. It also includes the ecosystems related to the digital bank's customer base, such as the merchants and logistics systems involved in the customers' regular purchasing activities.

Ecosystems offer a wealth of data and collaboration opportunities. Digital banks can provide seamless customer experiences and promote joint growth by integrating with various situations within the ecosystem. For example, the Swedish digital bank Klarna has embedded its Buy Now, Pay Later (BNPL) service into e-commerce to offer a seamless shopping and payment experience to users and achieve higher user retention. In terms of data use, digital banks, while ensuring personal information protection and data compliance, can use alternative data available within the ecosystem to achieve more precise customer acquisition, product pricing, and risk management through big data analysis.

Digital banks with varied backgrounds and resource endowments adopt different strategies when utilizing their respective ecosystems. Digital banks founded by internet giants, retailers, and leading payment companies are designed to be key components of an existing ecosystem right from the beginning. These banks use the diverse data available within the ecosystem to achieve data-driven end-to-end risk management and smart customer acquisition with high precision.

Some digital banks use financial services as an entry point to create super applications and ecosystems on their own that provide customers with one-stop solutions. For example, the Russian digital bank Tinkoff has established a customer-centric super application that provides a variety of services, including financial, lifestyle, and travel-related offerings, to enhance customer engagement and drive cross-selling.

On the other hand, transformed digital banks leverage resources accumulated by traditional banks, collaborate with external partners, and share ecosystem resources. Ally Bank, a leading digital bank in the US that originated from the financial services arm of General Motors, is a good example. Through its connections with General Motors, Chrysler, and their dealerships, Ally Bank has been able to capture a significant amount of auto finance business that has kept it profitable for many years.



KakaoBank (South Korea)

KakaoBank integrates, collaborates, and shares resources with companies within the Kakao Group ecosystem to enhance customer acquisition and experience.

Net profit

US\$268 million

net profit in 2023

ROE

5.98%

ROE in 2023

Customers

22 million retail customers

43%

of South Korea's population

Works with ecosystem companies for large-scale customer acquisition: KakaoBank shares contact lists with KakaoTalk, South Korea's largest instant messaging application, allowing users to transfer money to their friends within the application. It also jointly launched the "Party Passbook," which KakaoTalk chat group owners can use to collect membership fees from group members, confirm payments, and send reminders. Members can also check their fee income, expenses, and balances in real-time. This product has been widely accepted by South Korean consumers, with at least one in six South Korean adults using it by the end of 2021, and has attracted many new users and deposits to KakaoBank.

Leverages ecosystem IP resources for large-scale customer acquisition: KakaoBank offered free emoji packs featuring Kakao Friends characters to new account holders as part of a promotional campaign, which marked the beginning of a trend where the visual appeal of debit cards became a selling point in South Korea. With this product, KakaoBank set a record of 1.51 million new accounts opened and 1.03 million debit card applications within the first week of launch.

Improved linking process and experience to attract more customers: KakaoBank collaborates with South Korea's leading third-party payment provider, Kakao Pay, to simplify the account-linking process, which creates a seamless customer experience and broadens its target customer base. Kakao Pay users can spend money directly from their linked KakaoBank accounts and have access to the financial analysis services that track their income and expenses.

Source: Public information from annual reports, official websites, Oliver Wyman analysis



MYbank (China)

MYbank leverages the resources and network of the Alibaba ecosystem to develop financial services tailored to the specific needs of SMEs and individual business owners, and uses alternative data from the ecosystem to support customer identification and credit assessment.

Net profit

US\$580 million

net profit in 2023

ROE

21%

ROF in 2023

Customers

>53 million

cumulative MSMEs and individual business owners

Deeply embedded in the ecosystem to serve ecosystem customers: Almost all MYbank customers come from the Alibaba ecosystem. MYbank offers small loans to SMEs and individual business owners who sell on Taobao and Tmall. The loans provided by MYbank are typically small in amount and have flexible repayment terms to meet working capital or business expansion needs.

Ecosystem data shared to support big data risk control: While protecting data security and personal privacy, MYbank trains its unique risk models based on data from the Alibaba ecosystem, including transaction data from Taobao, payment and behavior data from Alipay, and logistics data from logistics service provider Cainiao. As this helps MYbank offer competitive loan pricing and manage bad loans effectively, it can offer credit support to users within the Alibaba ecosystem who lack traditional credit records or collateral.

Expanding services to cover the entire supply chain: By focusing on SMEs and individual businesses already within the ecosystem, MYbank uses advanced models to process and analyze large volumes of diverse data to cover the entire industry chain. With its information analysis capabilities, MYbank can quickly assess the business conditions of identified SMEs and individual businesses in seconds, helping it make informed credit decisions.

Source: Public information from annual reports, official websites, Oliver Wyman analysis

C. Exploring diversified business lines

The revenue of digital banks typically consists of NII and service fee income, but many leading digital banks are exploring diversified revenue streams for higher profitability and valuation in capital markets.

Digital banks are exploring new business lines, including providing Banking as a Service (BaaS), productizing technological capabilities, and offering non-financial services to SMEs. Digital banks offer BaaS by providing embedded financial services and products to other non-bank institutions or businesses through application programming interfaces (APIs), creating a more convenient and smoother financial experience for customers. Many digital banks are also considering providing their fintech solutions to others as service providers



of digital finance technology solutions and digital infrastructure. They offer digital finance solutions to other banks, including core banking systems, digital retail, and digital supply chain finance solutions. They can also provide broader digital infrastructure solutions, such as data privacy protection solutions and remote identity authentication, like electronic Know Your Customer (eKYC), which can be widely applied in retail, public services, healthcare, and other industries. Digital banks serving SMEs are also actively trying to offer non-financial services to their customers, including digital marketing, customer management, and personnel management, leveraging their scale and technological advantages to provide one-stop business services to SME customers.

Starling Bank (UK)

Starling Bank is productizing its core digital banking capabilities to provide core banking systems and other technical solutions to other digital banks.

Net profit

US\$180 million

net profit in 2023

ROE

28%

ROE in 2023

Customers

3.6 million

corporate and retail customers

SaaS income

US\$106 million

SaaS revenue in FY23 (FY23 total revenue was about US\$820 million)

Partnership on fintech solutions

Partnership with **2** banks

Provides services to build and operate a cloud-native bank: In March 2022, Starling Bank established a separate subsidiary, Engine, to offer cloud-native, modular core banking systems to support other financial institutions set up and manage digital-native banks. As of June 2024, Engine had reached partnerships with Salt Bank in Romania and AMP Bank in Australia, and was negotiating with an Asian bank to establish a digital bank through a technology equity partnership.

Combines technical solutions with operational experience: Engine can provide comprehensive services to build digital-native banks for other financial institutions and localize them according to local regulatory requirements and market demands. While helping other digital banks build their systems, Engine also uses its own operational experience to offer innovative product design, operations, and tools for process design in areas such as customer segmentation and payment processing.

Source: Public information from annual reports, official websites, Oliver Wyman analysis



Revolut (UK)

Revolut extends its services to existing SME customers by offering business management Software as a Service (SaaS) services, including human resources and performance management.

Net profit

US\$84 million

net profit in 2023

SaaS users

>325

companies have applied to use Revolut People SaaS services

Customers

40 million

retail customers

0.5 million

corporate customers

Extends services to existing customers by providing business management solutions: While working with SME clients, Revolut saw a demand for management solutions pertaining to human resources (HR) and enterprise resource planning (ERP) systems. As a leading digital bank with over 5,000 employees, Revolut has accumulated multiple mature solutions in the field of HR through years of operation. Revolut transformed its HR expertise into a product named Revolut People, launched in November 2023, to serve both current and potential clients by offering these new management solutions.

Provides a complete HR management product: Revolut People offers a comprehensive set of HR management tools to help clients achieve efficient HR management, performance evaluation, and employee recruitment.

More flexible subscription-based payment: Revolut People provides services using an SaaS model, where customers pay via subscription, charging £7.99 per active employee account per month. Companies can adjust their subscriptions based on their actual business needs, reducing upfront investment for business changes, making it more convenient, flexible, and cost-effective.

Source: Public information from annual reports, official websites, Oliver Wyman analysis

D. Exploring multi-market coverage

Some leading digital banks have expanded their operations to multiple markets beyond their home countries, with some even expanding across different continents. The EU's passporting scheme facilitates the expansion of digital banks within the EU. European digital banks, such as Revolut and N26, have expanded into multiple markets, with Revolut operating in over 30 markets. Digital banks like Nubank are also expanding across markets in the Americas and Africa. Asian digital banks are slower in regional expansion due to their initial operations starting later, and the need to focus on their large domestic markets. Despite the challenges, there are examples of Asian digital banks in market expansion, such as Singapore's GXS Bank collaborating with local enterprises to establish GX Bank in Malaysia.



Multi-market coverage is a result of digital banks seeking further growth. It is also an initiative by digital banks to apply their leading financial technologies, operational models, and practical experiences to other markets, as they strive to have a leading position in the global digital banking industry and increase their global impact and presence in the financial industry.

Compared to new market entrants, the bigger challenge for digital banks with multi-market coverage is to keep operations efficient and cost-effective across different markets. Among existing leading practices, it is more common to see successful multi-market expansions across similar markets. This is reflected in the similar economic structure of the markets and their financial consumer demands, or the similarity and even mutual recognition of regulatory systems.

Due to differences in regulatory requirements across markets, digital banks with multi-market coverage may need to change their core banking systems for new markets, especially payment and settlement-related systems or modules. They may also need to redesign their organizational structure and operational model for the specific market. Some markets may demand significant localization efforts, and setting up local teams might be necessary to meet these requirements. Given the changes and localization efforts needed, keeping their competitive advantages while adapting to new markets is challenging for digital banks. Therefore, many digital banks focus on becoming leaders within specific regions rather than globally. For example, N26 achieved success in the European market but withdrew from the American and Brazilian markets after brief attempts, shifting their focus back on their core continental European market.

Nubank (Brazil)

Nubank leveraged its expertise in credit card services as an entry point to new markets that share similar economic and consumer characteristics with Brazil, and has successfully expanded its operations across multiple markets within South America.

Net profit

US\$1 billion

net profit in 2023

ROE

26%

ROE in 2023

Markets

3 markets

Brazil, Mexico, Colombia

Customers

>100 million

First digital bank outside of Asia that achieved over 100 million customers

Since its launch in Brazil in 2013, Nubank used credit card services as an entry point into the Brazilian market, targeting low-income groups. Zero annual fees and easy-to-use digital platforms made Nubank's services attractive to customers. As of May 2024, Nubank's service covered 43% of the Brazilian population. Subsequently, Nubank expanded into Mexico and Colombia in 2020, where it also achieved success, covering seven million and one million individuals, respectively. The key success factors for its multi-market development strategy have been the following:

- Targeting markets that are similar to Brazil: Based on its experiences and success in Brazil, Nubank targets markets that are similar to Brazil when looking to expand. Specifically, Nubank looks for markets where consumer needs are like those in Brazil. Furthermore, it also considers the regulatory environment, preferring markets with similar regulations to Brazil. This allows Nubank to reuse a lot of its successful experiences from the Brazilian market, reducing costs and increasing the likelihood of success in new markets. Based on the above criteria, Nubank chose Mexico and Colombia, while avoiding markets such as the US and Canada, which are less similar to Brazil.
- Using no-annual-fee credit card services as an entry point: When expanding into new markets, Nubank consistently introduces its no-annual-fee credit card services as the first step. This approach allows Nubank to fully use its existing resources and capabilities while meeting the demands in the Mexican and Colombian markets.
- Offering tailored products to meet the needs of specific markets: After obtaining a banking license in Mexico, considering that Mexico is the second-largest recipient of remittances globally, Nubank collaborated with local fintech companies to launch international remittance services, allowing remittances to be received via WhatsApp. Nubank attracts customers by introducing customized products and services tailored to the needs of the local market.

Source: Public information from annual reports, official websites, Oliver Wyman analysis



N26 (Germany)

N26 has expanded its operations to cover 24 different markets within Europe. After brief entries into the American and Brazilian markets, it decided to shift its strategic focus on enhancing its operations within Europe.

Net profit

Negative

net profit in 2023

Customer

9 million

customers globally

Markets

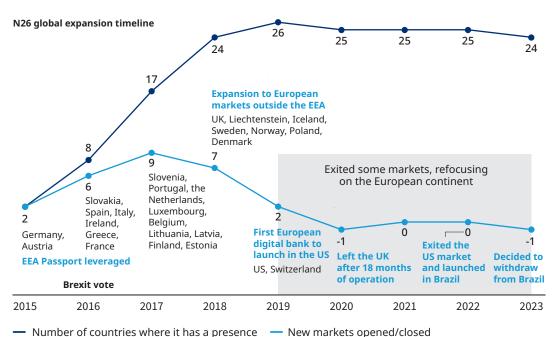
24 markets

All in Europe

Since its establishment in Germany in 2013, N26 has rapidly expanded across Europe by using the EU passporting scheme. By 2018, it had expanded to 24 countries and regions.

N26 entered the American market in 2019, becoming the first European digital bank to do so, but chose to exit after two years of operation. Similarly, N26 entered the Brazilian market in 2019. By 2023, N26 decided to exit the Brazilian market while it was still in its trial phase there. The challenges faced by N26 in its cross-market development are summarized as follows:

- Multiple market coverage required more resources than initially expected: N26 achieved success in covering multiple markets across the European continent, with relatively limited changes to its systems, products, and operations for each market. Therefore, when initially evaluating entry into the American and Brazilian markets, N26 expected that it could largely reuse its existing infrastructure and business models in the new markets. However, during the localization and trial operations, it realized that the extent to which it could reuse its existing systems and models was less than expected. The costs associated with adapting its services and acquiring customers were higher than its initial estimation, which led to its decision to exit these markets.
- **Strategic focus shift:** In 2018, N26 started expanding its operations beyond Europe, and the idea of becoming a global digital bank was well-received by investors. However, after 2020, the capital market's enthusiasm for investing in fintech waned, and N26's investors preferred the company to refocus its operations on major countries and regions in Europe.



Tambér de countries mere rende à presente

Source: Public information from annual reports, official websites, Oliver Wyman analysis

E. Driving infrastructure development to help data circulation

Data plays a key role in stimulating economic vitality, reshaping economic structures, and changing competitive landscapes. To maximize the value of data, it needs to be dynamic and shared, rather than static and isolated. However, the circulation and sharing of data faces several challenges. Considering the significant value of data to businesses and due to industry requirements, there are issues such as data silos, trust gaps, and security concerns within and between businesses. Valuable data being kept in separate, isolated ways prevents effective data circulation. The main challenge is to ensure the secure flow of data while addressing the risks associated with data usage and sharing.

Data is a core asset to digital banks, and the circulation and application of data, along with related technical capabilities, are among their core competencies. Therefore, digital banks not only play a key role in the circulation of data, but can also act as facilitators or promoters to drive the circulation and sharing of data elements and build a robust data ecosystem. By actively taking part in the circulation and sharing of data, digital banks can drive their growth and have broader positive impact on the building and application of financial infrastructure.

Digital banks need data from third parties, including public institutions such as legal and tax authorities, other financial institutions, and retailers to integrate the data and use it for purposes such as fraud prevention and risk control under the premise of ensuring data security. Furthermore, digital banks can also provide tools or interfaces to help third-party organizations access and use data that has been anonymized, or helpful information that has been derived from such data.

Leading digital banks are also trying to promote the circulation of useful data and innovative technology applications. One of the methods they are using is to offer open-source technologies: Digital banks are sharing the technologies and solutions they have developed in the area of data circulation, including secure computing, privacy computing, and federated learning, to data owners in open-source formats, helping them build their own technical solutions. They also provide productized solutions for data circulation: Digital banks offer mature, efficient, and secure data transmission, as well as mutual recognition solutions to businesses with data circulation needs, to make data more accessible and maximize its value while guaranteeing security and fairness.

WeBank (China)

WeBank's technology underpins valuable digital infrastructure, providing cross-boundary data flow solutions to enable trusted data circulation.

Net profit

US\$1.49 billion net profit in 2023

Customer

400 million

cumulative retail customers

4.5 million

cumulative MSME customers

Cross-boundary data circulation services

financial institutions served

Millions of retail users

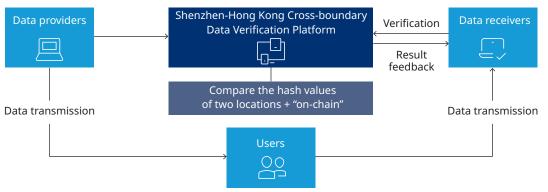
Users' data flows between institutions

Leading cross-boundary data flow solution: WeBank, using its open-source FISCO BCOS blockchain platform, works with multiple governments and financial institutions to jointly build cross-boundary data verification platforms. These platforms promote the secure and convenient verification and circulation of cross-boundary data, providing reliable data verification services for individuals, businesses, and organizations to facilitate cross-boundary work, life, and business activities. The solution adopts the concept of data portability, allowing users to play a key role in the data transmission process by actively managing the transmission process of their data. The platforms use blockchain technology to ensure the trustworthiness of data verification and the separation of data transmission and verification.

Application examples

Guangdong-Macao Cross-Boundary Data Verification Platform: Launched in March 2022, it provides efficient and convenient cross-boundary data verification services for residents of Guangdong and Macao. WeBank is responsible for the overall platform design and technical support. Currently, it serves 10 financial institutions, including Industrial and Commercial Bank of China, China Construction Bank, and Bank of China for four use cases, such as cross-boundary asset certification and bank statement certification. Consequently, the processing time for Macao residents' personal asset certification has been reduced from three to five days to five minutes.

Shenzhen-Hong Kong Cross-Boundary Data Verification Platform: Launched for trial operation in May 2024, the Shenzhen-Hong Kong Cross-Boundary Data Verification Platform includes cross-boundary verification of corporate credit reports, credit information authorized by small and micro business owners, and corporate KYC reports in its initial service launch.



Source: WeBank, Oliver Wyman analysis

CHAPTER 3

THE FUTURE OF DIGITAL BANKS

Digital banks will continue to be innovation drivers in the financial services industry. With the continuous development of technologies and applications, such as AI, Web 3.0, the Internet of Things (IoT), and the metaverse, the digital banking industry will continue to see innovative applications, products, and services. The ways digital banks are structured and operate may further evolve with the emergence of new technologies, which will contribute to increasing the overall value of the industry.

DIGITAL BANKS WILL CONTINUE TO BE INNOVATION DRIVERS IN THE FINANCIAL SERVICES INDUSTRY

Although digital banks now can be found in many places around the world, their development varies significantly. In many countries and regions, digital banks are either just emerging or are still undergoing regulatory review and planning phases. These markets are likely to see a new wave of digital banks. For example, some countries in Southeast Asia, Africa, and South America are in the early stages of digital banking development, and more digital banks are expected to enter these markets in the coming years.

It has become an industry consensus that digital banks will play an important role in the global banking sector. However, they are unlikely to become industry disruptors that fundamentally change the existing banking landscape. Instead, they will continue to act as catalysts within the banking industry, leveraging their fintech and innovation capabilities to serve as innovation drivers within the financial system to maintain innovation momentum within the banking sector.

Leading digital banks have already reached economies of scale and strong profitability. In the coming years, gaps between leaders and followers are expected to widen in terms of profitability, market coverage, and influence over industry standards, which may be gradually established. The technical standards and risk management models of leading players could be adopted as common industry standards, promoting the consistency and overall development of the digital banking sector.

The leading advantage of Chinese digital banks will gradually diminish and they will face more challenges as global peers accelerate their own development. The questions of how to deal with the challenges posed by new technologies, new standards, and new models from digital banks elsewhere, and how to serve a broader market, will become the next focus of Chinese digital banks.

EMERGING TECHNOLOGIES WILL CONTINUE TO DRIVE CHANGES IN THE WAYS DIGITAL BANKS ARE STRUCTURED AND OPERATE

With the continuous development of technologies and applications such as AI, Web 3.0, the Internet of Things (IoT), and the metaverse, the digital banking industry will continue to see innovative applications, products, and services. The ways digital banks are structured and operate may further evolve with the emergence of new technologies, which will contribute to increasing the overall value of the industry.

Driven by new technologies, pioneers in digital banking are already experimenting with their service models, customer engagement, and business content, although most of these innovations are still far from being commercialized. For example, technologies such as generative AI and voice synthesis enable digital banks to implement virtual bank managers with a higher level of automation and personalization. This allows customer experiences similar to traditional in-person services while maintaining low costs and high efficiency, as well as adding a human touch to digital banking services. Additionally, IoT technology allows digital banks to engage customers in real-world settings, instead of through applications and social media only. Many digital banks have made efforts to embed services such as payments and wealth management into wearable devices and cars, offering personalized products and services as customers go about their day in real time. Furthermore, the development of the metaverse has driven the demand for digital asset management. Compared to traditional banks, digital banks have a greater advantage in providing financial services for digital assets. While following local laws and regulations, digital banks in some countries and regions are experimenting with "metaverse banks" as bridges between digital and real-world assets, by setting up virtual branches and virtual wallets to help users manage their digital assets.

These attempts are still in their early stages, and many require further validation in terms of technology, business, and compliance. However, some of these efforts may lead to new digital banking models through continuous updates and iterations, such as AI-driven banks, creating a new category of technology-driven banking service providers.

Exhibit 6: The future of digital banks

	Dedicated RM a "human" tou		"Ubiquitou	s" lifestyle bank	"Steward" o and physica	f both digital l assets¹	
Future models	Digital banks can offer		banking app physical bra banking ser future are a through IoT various ever including bu	nches, the vices of the ccessible devices in ryday settings, it not limited to , shopping malls,	While adhering to local legal and regulatory frameworks, the banks of the future can use virtual wallets to assist customers in managing their digital assets in the metaverse, such as cryptocurrencies and virtual real estate, and provide financial services based on digital assets		
Tech drivers	Generative AI	Machine learning	IoT	Biometrics	VR/AR	Blockchain	

^{1.} The laws, regulations, and requirements for digital assets vary by country and region. This attempt is limited to a small number of countries and regions where digital asset transactions are permitted.

Source: Oliver Wyman analysis



THE BOUNDARIES BETWEEN TRADITIONAL AND DIGITAL BANKS WILL GRADUALLY BLUR

With the increase in scale and diversification of services, leading digital banks are beginning to adopt traditional banking models. For example, digital banks in Japan offer offline branch services and automated teller machines (ATMs), while virtual banks in the Hong Kong SAR, such as WeLab Bank, have started using relationship managers to serve mid-to-high-net-worth clients. European digital banks are also actively looking to obtain licenses for securities brokerage and other services to provide one-stop personal financial services. These initiatives show the evolution of digital banking business models, as they explore opportunities to integrate online and offline services, combine human and automated services, and offer comprehensive financial services, while keeping the key benefits of convenience and low fees for which digital banks are known.

At the same time, after more than a decade of digital transformation, many leading traditional banks have built strong technological and data capabilities and are continuously exploring new business models. In many markets, traditional banks can now offer full services online, including remote account opening and online loans. Additionally, traditional banks have customized credit and financial service products for specific customer groups, such as young people and SMEs. These innovative services improve not only the customer experience but also the competitiveness of traditional banks in the digital era, aligning their service models more closely with those of digital banks.

Regardless of whether the more advanced "banks" of the future will still be called "digital banks," together with today's digital banking pioneers, they will undoubtedly bring more innovation and momentum to the development and transformation of the global banking industry and help shape its future.



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