# TECHNOBANKER

*Capabilities and skills*
*for the next generation of*
*intelligent digital banking*

*By*

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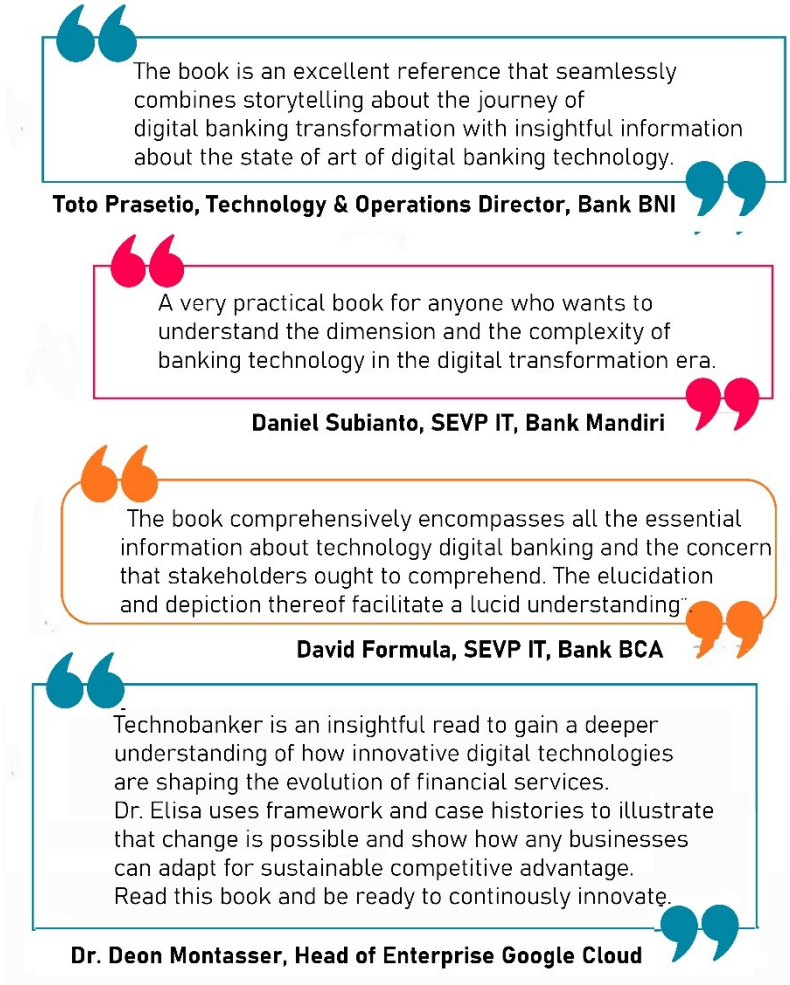
***Many thanks to my beautiful family:***

*Victor, Seraphina, Maximilian, and Gloria. I wanted to say thank you for always being there for me. I feel very lucky to have such wonderful people in my life.*

***My respect to my parents:***

*Christina (mom) and Frans (dad) for always giving me so much opportunity to learn and grow.*

# *Praise For Technobanker*



# *Introduction*

Technological progress, especially in the internet and smartphones, is drastically shifting our lives. This change is shaking the foundations of the traditional banking industry, a sector once unchallenged in its dominance, thanks to the rise of FinTech and BigTech companies. Some industry experts and academics fear that this could spell the end for traditional banks. I see it differently. I believe these banks are not doomed; they're just facing a new kind of competition. Their survival hinges on crafting robust digital strategies and forming alliances with FinTech and BigTech firms. This collaboration is key to expanding financial services access and promoting broader financial inclusion.

The year 2020, with its pandemic-induced social distancing, impacted both businesses and individuals profoundly. Yet, in these challenging times, digital banking and payment systems emerged as a silver lining, offering a glimpse of hope. In the post-pandemic world, banks are reimagining themselves to fit into this new reality. Staying relevant now means crafting experiences tailored for a world reshaped by the pandemic. This

world demands an understanding of the upcoming technological and cultural shifts, along with the evolution of business models.


While writing this book, I identified a significant challenge for banks riding the digital wave: human resources. I coined the term "Technobankers" to describe a new breed of banking professionals – ones who are adept at integrating technology into the banking fabric. Recruiting and training these talents in cutting-edge technology is a daunting task. This book aims to be an essential resource, offering real-world insights for everyone from recent graduates to banking professionals and leaders. I present an overview of the competencies that are required for the development of intelligent digital

banking based on my experiences in the industry as well as the findings of my research as a researcher. As a recent graduate, becoming a developer in my early career is not an easy path. I recall working on two efforts relating to financial services online and different electronic banking initiatives in the late 1990s and early 2000s when Internet banking was still in its infancy in Indonesia. At the time, our learning resources were extremely restricted.

After receiving my postgraduate degree and being promoted to head of research and business intelligence, I was given the responsibility of managing data, doing business intelligence, and conducting research for a consumer banking organization. Following that, I chose to go on a new career as an entrepreneur, starting my first company (e-commerce) in 2005 and establishing my second, the IT consulting firm "Digimaster" in 2017. I assist several businesses on their digital transformation journey. Financial services, social services, property management and manufacturing are among the industries represented. Despite my industrial background, I earned a doctorate and did research in computer science and information systems. I have a strong research interest and have focused my studies on

digital banking and process innovation using new methods of working such as Agile and design thinking.

"Technobanker" takes you through the journey of digitalization in banking. It targets a significant transformation in bank business and operational models, navigating various challenges: technological disruptions, digital ecosystems, and risks. The focus is on the future of emerging technologies like Artificial Intelligence, Blockchain, Cloud Computing, Big Data, and the Internet of Things (IoT), which are reshaping the banking sector by enabling sophisticated digital banking systems. It is my aim that the readers will gain a better understanding of the changing environment of digital banking as a result of my journey to learn, unlearn, and reskill for the most recent technologies in the past twenty years. Afterwards, it lays the groundwork for the future "technobankers" to develop the competencies and abilities necessary for the next generation of intelligent digital banking.

# *Acknowledgements*

Navigating the ever-evolving industry and technology landscape has made completing this book a formidable yet fulfilling journey. I am thrilled to present the final result.

My heartfelt thanks go to the Technobankers whose insights and experiences greatly enriched this book. Their contributions were invaluable. I also extend my appreciation to the Digimaster team. Their dedication to developing digital banking learning labs and fostering experiential learning has been instrumental.

A special mention to the Digi Optima Publishing team for their exceptional work in designing the book, from its captivating cover to the thoughtful interior layouts, as well as their meticulous editorial and publishing efforts.

I hope "Technobankers" informs and inspires you in crafting future digital strategies. For continuous updates and insights on banking technology, I invite you to visit https://www.techobanker.com.

**Dr. Elisa Indriasari**

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# CHAPTER 1

## *Digital Banking Revolution*


***"Losing a smartphone today can be more distressing than misplacing a physical wallet. As we ride the digital wave, society is transitioning towards a cashless and paperless era."***

## Global Phenomena in FinTech

The last few decades have witnessed a digital revolution in banking, marked by significant technological advancements. Initially, banking was all about physical transactions and manual record-keeping. This has evolved into a digital-centric era, propelled by new technologies.

Bank branches were once the hubs of banking activities. The introduction of ATMs in the 1960s, followed by the invention of credit and debit cards, transformed customer interactions and reduced cash dependence.

The late 1990s saw banks embracing online banking, coinciding with the rise of the Internet and e-commerce. The early 2000s marked the advent of mobile banking apps, in line with the emergence of smarter mobile devices. Fast forward to 2015, and we see a different landscape, shaped by the internet, smartphones, artificial intelligence, big data, cloud computing, and social media.

This era is characterized by consumer demand for easier financial management through smartphones, leading to the integration of various banking services into one digital banking application. Figure 1.1 charts this evolution from online banking to digital banking.

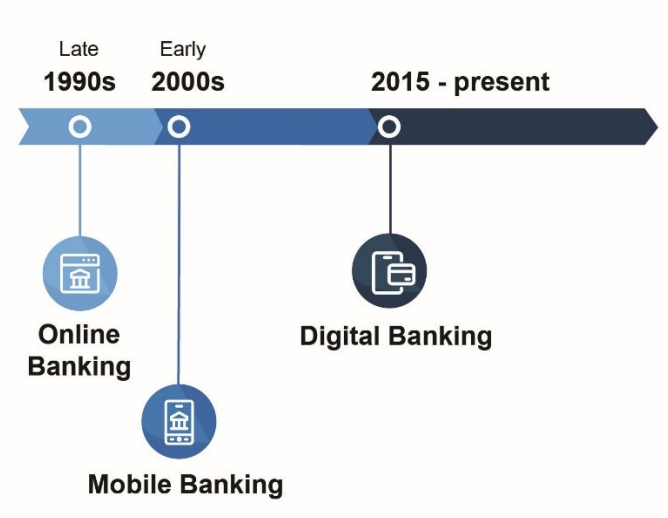


**Figure 1.1** Evolution from Online Banking to Digital Banking

Banks have always had their unique strategies to stand out in the market, but their core functions remain largely the same

1. **Savings and Deposits:** Banks offer customers a haven for cash, earning interest over time. This security is backed by deposit insurance and stringent regulations.

2. **Payment Systems:** As intermediaries, banks facilitate transactions with various entities. They provide customers with diverse payment options like cards, transfers, digital wallets, and digital banking platforms, integrating with contemporary banking systems.

3. **Loans:** By lending to individuals and businesses, banks earn through the interest spread—the difference between what they pay on deposits and what they make on loans.

However, the financial landscape is rapidly evolving. Banks are no longer the sole innovators in finance. The rise of digital nomads and remote working models has spurred a demand for global payment networks like PayPal. These individuals, embracing

digital currencies and payment technologies, challenge traditional banking structures.

FinTech companies seize this opportunity to offer user-friendly services and build direct customer relationships. This shift threatens the established banks' brand equity, pushing them to undergo significant digital transformations to stay relevant.

Banks are now racing to integrate advanced technologies like AI, big data, Blockchain, cloud computing, and the Internet of Things. These innovations not only automate banking processes but also offer personalized financial services. The future envisions a mobile phone replacing traditional banking tools, secured with biometric technology, offering a sophisticated and tailored banking experience.

Initially, there was scepticism about the viability of traditional banks in the digital era. However, this sentiment is changing. Incumbent banks can maintain their competitive edge by embracing

emerging technologies and implementing robust digital strategies.

**Big Banks Creating Digital Payment**

Reflecting on the evolution of human behaviour and reliance on technology, I recall a personal experience in Belgium. I had left my smartphone at my son's dormitory and found myself stranded without access to it. This incident highlighted just how essential our smartphones have become, especially when I nearly missed my flight home to Indonesia.

In today's digital era, losing a smartphone can be more disruptive than losing a physical wallet. Our phones are not just communication devices; they store e-tickets, digital payment apps, and banking information. For instance, I needed my phone to buy train tickets and pay for dinner and souvenirs. The absence of my smartphone would have been a significant inconvenience.

Gone are the days when forgetting a physical wallet was a major concern. Many of us rely on digital

wallets for transactions at various outlets. But what exactly is a digital wallet? It's a financial transaction app on any connected device, allowing users to make payments via near-field communication (NFC).

With NFC, smartphone users can make contactless payments by tapping their devices on compatible terminals. This technology, embraced by mobile wallet providers, banks, and credit card companies, has made carrying physical wallets and cards obsolete.

The rise of digital wallets began with the internet's and e-commerce expansion in the late 1990s. Pioneers like PayPal and Google Wallet paved the way. PayPal, founded in 1999, became widely recognized after its 2002 IPO and subsequent acquisition by eBay.

The rise in popularity of mobile wallets coincided with the advancement of mobile phone technology. In February 2004, Jack Ma, the founder of Alibaba Group, introduced Alipay. Statista reports that

Alipay is the dominant payment platform in China, boasting a global user base of 1.3 billion by 2022. Not only is Alipay entering the financial industry, but Nokia also provided mobile payment services in 2007. In 2012, Apple introduced the Passbook. In 2014, this progressed into Apple Pay.

Apple Pay is promoted as a substitute for many types of payment cards, including chip and PIN cards and classic magnetic stripe cards. Apple Pay is compatible with iPhone devices starting from the iPhone 6 and newer, as well as the Apple Watch, iPad, and MacBook.

Most prominent credit and debit cards presently offer compatibility with Apple Pay. Although Android mobile devices are not compatible with Apple Pay, the number of active users for this payment service will have surpassed 500 million by 2022.

In 2011, Google launched "Google Wallet," which was then merged with Android Pay in 2018 to create

a new application named Google Pay. Google Pay is projected to reach more than 150 million active users by 2022.

In 2022, mobile wallets accounted for roughly half of global e-commerce payment transactions. The market size of such wallets varied significantly between regions, however. Estimates are that out of approximately 2.8 billion mobile wallets in use worldwide, nearly half were in Asia-Pacific alone. China, India, and Southeast Asia are behind this trend. Disruption in digital payment motivates banks worldwide to develop digital wallets. Many big banks in the US, such as Bank of America, JP Morgan, and Wells Fargo, are working on digital wallets. Indeed, in North America and Europe, the mobile payments topic increasingly overlaps with discussions on "alternative payments" - all payments conducted without cash or cards. Credit cards are popular in North America and Europe, but also in Japan and South Korea. That leaves many to wonder if, how, and when mobile wallets will compete against the

already established card networks in these countries (Statista, 2024).

Another success story in digital wallet initiatives can be found in Southeast Asia. Following the COVID-19 outbreak, digital payments surged significantly, particularly in Singapore and Indonesia. In Singapore, DBS PayLah! Initiated in 2014. Initially built as a mobile app, it focused on peer-to-peer payment at first. Failing to pass the "toothbrush" test led to offering merchant payment and adding bill payments, donations, pre-paid top-ups, and online checkout (Speculand, 2021). Cashless society has grown significantly, since its introduction by Indonesia's central bank in 2019, QRIS (Quick Response Code Indonesian Standard) has been utilized in five countries: Indonesia, Singapore, Thailand, Malaysia, and the Philippines. Indonesia's major banks, including Bank Mandiri, BCA, and BNI, participate in the QRIS digital ecosystem to boost tourists and small companies. The QRIS digital ecosystem is an application of the open banking

principle, allowing Indonesia to foster economic growth after the COVID-19 outbreak. Figure 1.2 illustrates the history of digital payment.

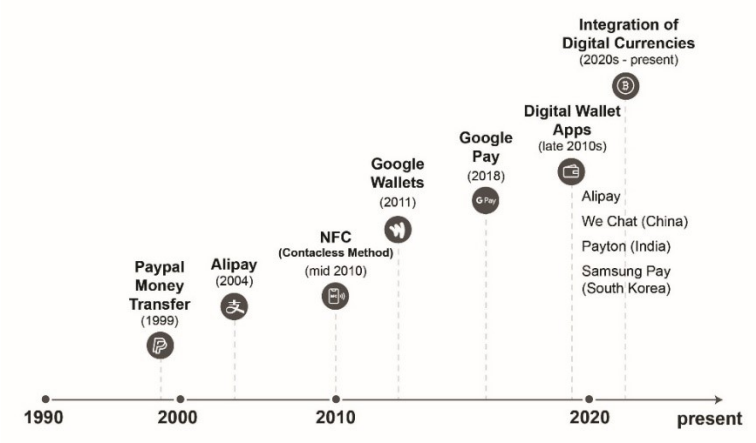


**Figure 1.2** The History of Digital Payment

The global digital payments market is projected to grow at a positive growth in the coming years. The Asia-Pacific region is expected to dominate the market, followed by North America and Europe, owing to the increasing adoption of digital payments in these regions. The rising number of partnerships and collaborations among payment service providers and the implementation of advanced technologies such as blockchain and artificial intelligence are also

expected to drive market growth in the coming years (Statista, 2024).

## Digital-Native Challenger Banks

Unlike traditional financial institutions, often hindered by outdated IT systems and rigid business models, digital-native banks have emerged, tailored specifically to meet the needs of modern customer groups. These FinTech challengers, being agile and customer-focused, contrast sharply with traditional banks, which are bogged down by compliance, consumer protection, and complex bureaucratic structures. As of December 2023, the six app-only digital banks in Europe had more than 117 million app downloads combined (Statista, 2023).

P2P platforms exemplify transparency in borrowing and lending, relying on community assessment rather than anonymous credit committees. This approach resonates with a younger demographic accustomed to social media, leading to high consumer satisfaction rates.

Neo banks, such as Monzo, N26, Starling, and Revolut, have emerged in Europe, promising a revolution in banking services. They cater to millennials with a variety of services, including accounts, credit cards, loans, investment opportunities, and money management tools. Their trendy, wallet-friendly cards and partnerships with popular pubs, cafes, and shops, offering discounts, appeal directly to millennial and Gen Z lifestyles.

In studying various digital challenger banks, I've identified six key traits that form their core DNA:

1. Digital infrastructure
2. Digitally native clients
3. Customer-centric services
4. Agile mindset
5. Digital top talent
6. Compliance with digital regulations

These banks often collaborate with FinTech firms to offer enhanced services like budgeting, financial analytics, and integration with different payment platforms. The rise of challenger banks has significantly changed the banking competitive landscape, compelling traditional institutions to evolve their digital strategies. This requires them to refine growth plans, revamp operational models, and re-prioritize their transformation agenda.

**Digital Currency**

China, long a global leader in e-commerce and digital payments, has been on the cusp of becoming a cashless society even before the COVID-19 pandemic. During a visit to China's major cities in 2017, I observed that nearly all merchants accepted digital payments. The majority of transactions were conducted through popular private apps like Alipay and WeChat Pay, operating independently of state control.

Since 2019, China, the world's second-largest economy, has been pioneering the use of digital currency in several major urban areas. This initiative places China ahead of Europe and the United States in the race to establish a government-backed digital currency known as Central Bank Digital Currency (CBDC). The digital yuan, issued by the People's Bank of China (PBOC), is a digital version of the renminbi (RMB) and is fully endorsed by the Chinese government. CBDC transactions boast enhanced security, with technologies like digital certificates, digital signatures, and encrypted storage, effectively preventing double-spending, illegal duplication, counterfeiting, and transaction falsification. China's trial of the CBDC began in April 2020 in four cities: Shenzhen, Suzhou, Xiongan, and Chengdu. The pilot has since expanded to include fifteen provinces and twenty-three cities, with notable additions like Chongqing and Guangzhou. By January 2023, the People's Bank of China released a wallet app for the digital yuan, accessible in over a dozen pilot regions. The digital yuan initially targets the domestic market,

but its use was first extended to foreigners during the Beijing Winter Olympics in February 2022. Further expansion occurred in Zhejiang, chosen for its role as host of the 2023 Asian Games, allowing the PBOC to test the digital yuan with international visitors (Figure 1.3).

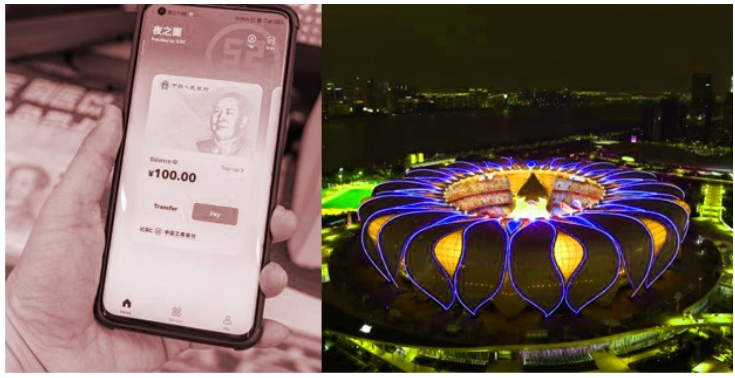


**Figure 1.3** Digital Yuan Instant Payment at Asian Games 2023

While this marks significant progress in the adoption of digital currency, the transition for Chinese citizens may take time. Alipay and WeChat Pay, with their vast user bases, remain the dominant players in the market. However, the move towards digital currencies is gaining momentum globally, with

various countries in Asia, Europe, and America likely to follow China.

**Impact of COVID-19 on Banking Sector**

The COVID-19 pandemic has significantly reshaped the financial services industry, accelerating shifts towards cashless payments and highlighting the sector's role in promoting inclusivity. The pandemic's impact was profound, altering operational models and customer engagement in banking. I believe the pandemic's effects can be categorized into four key areas:

1. Customer behavior
2. Human resources
3. Regulatory compliance
4. Profitability

These changes are illustrated in Figure 1.4.

From a customer standpoint, the pandemic led to a drastic reduction in face-to-face interactions at banks. Customers increasingly turned to digital

channels for their banking needs, moving away from branch visits. While cashless transactions have become the norm, it's essential to recognize that segments of society, particularly older customers with significant deposits, still prefer in-branch services. Therefore, maintaining a balance with a reduced but strategic number of physical branches is advisable.

In terms of human resources, the pandemic revolutionized work culture. Banks are now embracing remote and hybrid work models, and there's a heightened demand for digital talent due to the extensive digitization of business processes. Regulatory and compliance aspects have also transformed. As banks shifted from physical document distribution through localized networks to digital channels, they faced new regulatory challenges. This shift necessitated the adoption of updated standards and procedures to ensure secure transactions and prevent fraud and money laundering. Regarding profitability, the pandemic

impacted banks' revenue streams. There was a notable dip in interest income due to delayed loan payments and a decrease in fee-based income from physical point-of-sale transactions. Conversely, there's been an uptick in digital banking usage, online shopping, and digital payment methods.


**Figure 1.4** Impact of COVID-19 on the Banking Sector

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DR ELISA INDRIASARI the CEO of Digimaster is a researcher in information systems and computer science. She was nominated for the Woman in ICT Awards by Channel Asia in 2021. Elisa has spent the last 25 years in technology, working to bring customer-centric IT solutions. She published numerous articles in international journals, primarily on digital innovation, information systems, and computer science. She regularly leads seminars and boot camps and works directly with client teams to build digital transformation, IT strategy, and digital innovation. As a consultant, she assists customers in competing in the digital world by cultivating digital skills and enhancing their working methods to achieve agility in the digital era.