

OPTICS: Defining "future banks"



November 2020

Contents

- 01 New system to evaluate and guide future banks
- 02 A digital, smart and open paradigm
- 03 The OPTICS capability system supports digital, smart and open operations
- 04 The preliminary construction of OPTICS capabilities
- 05 Quantitative testing and revision of the indicator system
- 06 Conclusion

Introduction

Since early 2020, industries have been struggling to survive following the sudden outbreak of COVID-19. This turbulent period has become a major test for the products, operations, and risk management capabilities of banks. On the bright side, the outbreak has prompted banks to accelerate their efforts in the areas of online operations and digitalisation, and more digitalised banks are being rewarded for their efforts.

In recent years, banks have been attempting to develop innovative ideas and implement practices in line with their digital transformation strategy, across topics such as Internet banking, intelligent finance, digital financial inclusion, open banking, and agile operations. While such initiatives previously may have been viewed as “nice-to-have” strategic options for long-term growth, they have since become “must-haves” for banks that want to ensure future success.

Transformation is no easy feat. In this regard, the president of a leading bank in China said in an open letter in March: “We followed our customers into new lifestyle-oriented business scenarios, but found ourselves as strangers. We strived to forge digital operations, but found the infrastructure insufficient. We wanted to gear into the fast lane of technology advancement, but felt that the organisational evolution lagged behind. We wanted to simplify our organisation, but found that the culture is not open and inclusive enough, which made us falter.”

In times of difficulty, those able to rise to the challenge will ultimately achieve success. Banking industry leaders are now starting – or should be starting – to consider:

- What will future banks and their business models look like?
- What capabilities should banks have to meet future challenges?
- How can we reshape organisations, technologies, personnel and products to build these capabilities for the future?
- Are there any generally accepted standards for these capabilities?

To answer these questions, this report summarises the leading practices of banks inside and outside China, and provides the OPTICS system to bankers based on real-life case studies and statistics. OPTICS is an evaluation system for future banks covering six dimensions: Organisation, Product and Service, Technology, Information and Data, Calibre, and Spend. This system is designed to help the industry understand current dynamics and to clarify the path towards a more digital, smart and open future.

01.

New system to evaluate and guide future banks

1 Traditional methods of evaluating commercial banks focus more on robustness and risk than innovation.

There are several well-developed systems in China and around the world for evaluating commercial banks that can serve as guidance for banks as they bolster operational capabilities. Widely accepted evaluation systems include CAMELS in the US,¹ ARROW (Advanced Risk-Responsive Operating Framework) and Firm Systematic Framework in the UK. These evaluation systems are similar in that they focus on regulatory compliance, current asset quality, risk control monitoring, and the robustness of operations. However, they may lack impetus in terms of building sound future capabilities for banks, especially regarding the following two aspects:

First, these systems eschew the innovative potential of banks. In pursuing healthy development, banks not only rely on effective control, risk monitoring, and robust operations, but they also need to innovate products and business models. Innovation is at the heart of corporate development, and appropriate and constructive innovation can in fact lead to not only greater revenue and assets, but also strengthen their ability to mitigate risk and create value.

Second, what new requirements are banks facing in the digital era? The rise of the Internet and fintech has meant that financial demands are increasingly contextual, fragmented and diversified, and cross-industry competitors are emerging in the form of tech firms. Around the world, banks that have stayed in their comfort zones are now being pushed towards the forefront of digitalisation as a result of these unprecedented changes. Pertinent questions are being asked, such as “What new capabilities should banks in the digital era have? What banks are better positioned in terms of digitalisation and performance?” However, the existing evaluation systems fail to offer clear or appropriate answers.

The two inadequacies described above reflect the existing evaluation systems’ emphasis on robustness, and their lack of attention to innovation, technology and changes. Innovation, technology and changes do not conflict with robustness. Today, as banks are embracing fintech and actively undergoing innovative transformation, we need to consider what capabilities future banks should have.

¹ CAMELS refers to Capital Adequacy, Asset Quality, Management Capability, Earnings, Liquidity and Sensitivity.

2 The banking industry needs a new system to evaluate and guide future development.

In recent years, Boston Consulting Group (BCG) has developed the Digital Acceleration Index (DAI), a corporate digital capability index system incorporating 25 indicators that profile the digital maturity of companies across various industries. However, DAI is an all-inclusive evaluation system; it is not customised or tailor-made for any particular industry. Thus, it remains important and necessary to develop a system designed to evaluate banks' digital capabilities and guide banks in their digital transformation. Brett King, author of the bestseller *Bank 4.0*, suggested a "scorecard"² test of 14 questions to assess how digitalised a bank is.

However, he does not explain the logical relationship between the 14 questions, and unlike indicators, the practical application is limited.

We still need a comprehensive system for evaluating future banks to determine what they should look like and what capabilities they should have. We need a system to evaluate future banks' capabilities and guide banks in developing new capabilities. This report proposes a capability system and outlines the essential characteristics and capabilities that banks of the future should have.



² King, B. (2018). *Bank 4.0*. Wiley.

02.

A digital, smart and open paradigm

Before we can gain an understanding of the capabilities of future banks, we need to know what a future bank is and its essential characteristics. Currently, banks around the world attach certain names to themselves to indicate their future characteristics, such as digital banks, Internet banks, virtual banks and challenger banks. One similarity they share is their reliance on digital networks rather than physical ones as the basis for customer interaction. They also avail of leading technologies to provide online banking services that are tailor-made for their customers.³ Ideally, future banks will make banking services available anytime and anywhere, as described in *Bank 4.0: Banking Everywhere, Never at a Bank*.⁴

To reach this stage, **future banks need to be digitalised, smart and open**. These three characteristics form the business paradigm of a future bank. Being digital means that banking operations are based on information infrastructure, comprising of computers, terminals and the Internet, or an operating platform consisting of “clouds, networks, and terminals”, and the data generated by this infrastructure is treated as an important asset and production factor.⁵ Being smart means that banks carry out their business activities based

on data, algorithms and devices, and that they use highly automated operating processes to achieve quality results. Being open means that banks provide services to customers, employees, third-party developers, fintech companies, vendors and other business partners by sharing data, algorithms, transactions, processes, and other business functions with the business ecosystem in which they operate.⁶

Being digital, smart and open defines the business paradigm of future banks and redefines their core assets, business drivers and organisational structure.

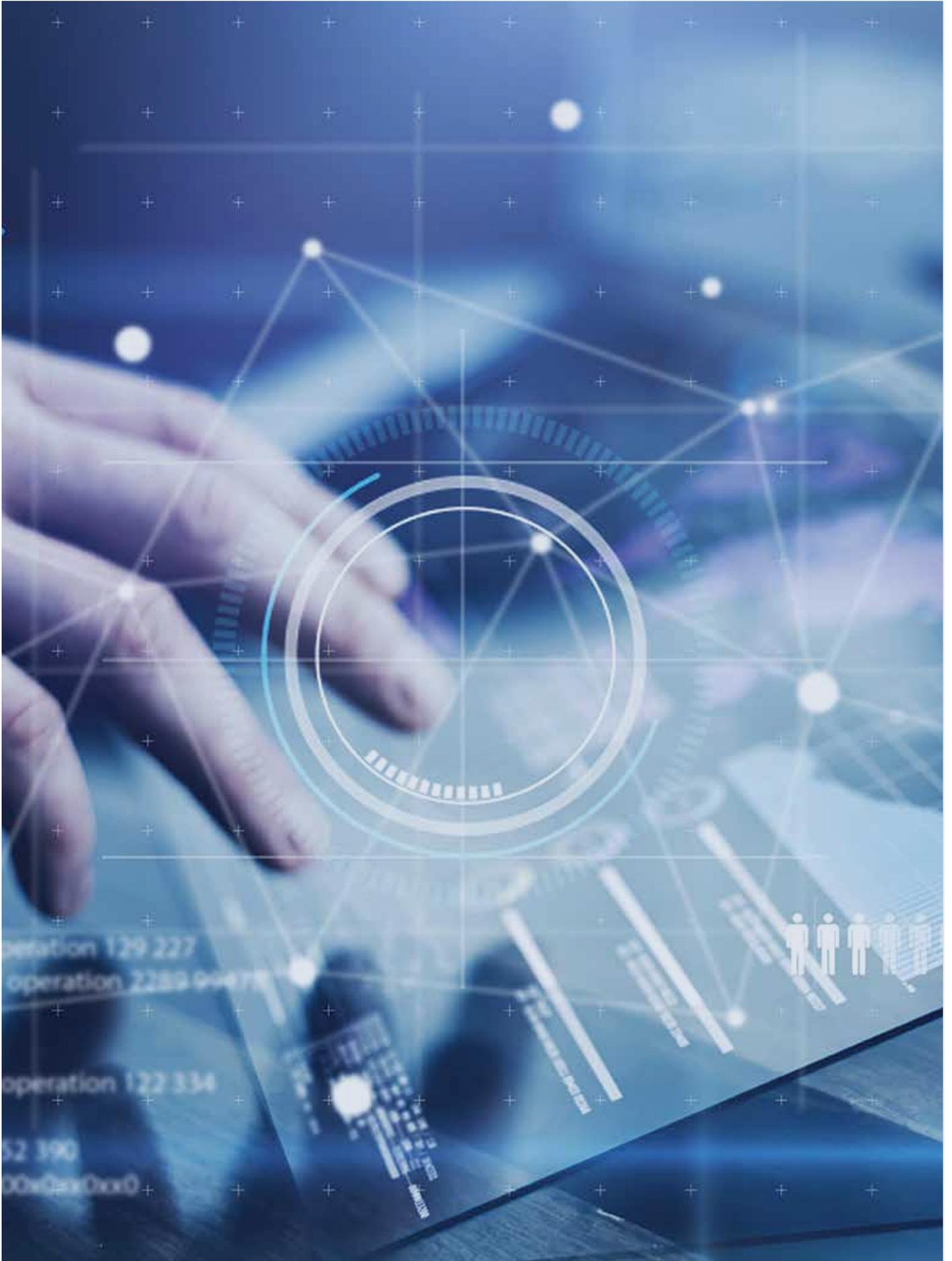
Being digital provides banks with their core asset – data. For banks, data is the pivotal factor of production as it enables them to fully and seamlessly understand their customers. Being smart is the business driver that pushes banks to provide better services based on their understanding of customer needs. Being open enables banks to open up their existing technological and resource systems and work with a wider variety of entities on equal terms. By embracing openness, banks can acquire more valuable factors of production, achieve stronger productivity, and reach out to their customers and business partners anywhere.

³ Skinner, C. (2014). *Digital Bank: Strategies to Launch or Become a Digital Bank*. Marshall Cavendish International (Asia) Pte Ltd.

⁴ King, B. (2018). *Bank 4.0*. Wiley. “Bank 1.0” refers to the traditional model whereby banks rely on offline physical networks to provide services. “Bank 2.0” refers to the stage in which banks shift to electronic and online channels to provide services. “Bank 3.0” refers to the stage when banking operations become intelligent and automated.

⁵ AliResearch. (2017). *Digital Economy 2.0*.

⁶ Siqi, Li. (2018). *Open Bank: the Innovator behind the Innovator (开放银行: 创新者背后的创新者)*. See “WeInsights” https://mp.weixin.qq.com/s/jGczZE_Jzc1jMWvlfuL1Sg



03.

The OPTICS capability system supports digital, smart and open operations

We categorise future banks' capabilities into six dimensions: **Organisation, Product and Service, Technology, Information and Data, Calibre,** and **Spend**. This is how we get the "OPTICS" acronym. These capabilities interact and work together from various perspectives, enabling banks to coordinate their various assets; research and reorganise; explore, identify and seize opportunities; and support digital, smart and open operations. Of these capabilities, Organisation and Information and Data are the foundation on which banks build their new organisational structures. Product and Service, Technology, and Calibre are the business drivers; and Information and Data and Spend are closely related to banks' core assets.

1) **Organisation** measures how effectively a bank leads and supports development from the strategic, structural and cultural perspectives of an organisation. It indicates the organisation's insight, flexibility and action in developing and continuously updating strategies and tactics in a changing environment to meet corporate goals.⁷ This is especially important to innovative enterprises because innovation is an uncertain,

centralised and cumulative learning process, and the innovation process requires firm and appropriate support from the enterprise strategically and organisationally. Organisation is the fundamental supporting force for banks during the learning and evolution process.

2) **Product and Service** signifies banks' capabilities in developing, marketing, operating and upgrading products and services. Cutting-edge products and services enable banks to stand out from market competition. Digitally, banks need to develop products that can be quickly rolled out across online channels. Products should be embedded with an event tracking function to capture customer behaviour information at each step of interaction. In respect of smart operations, developing products that feature effective human-computer interaction and analytical performance is increasingly important in providing precise and satisfactory services. As banks become more open in sharing financial resources and technological capabilities, they need to work with their partners to develop products that are adaptive to these partners' scenarios.

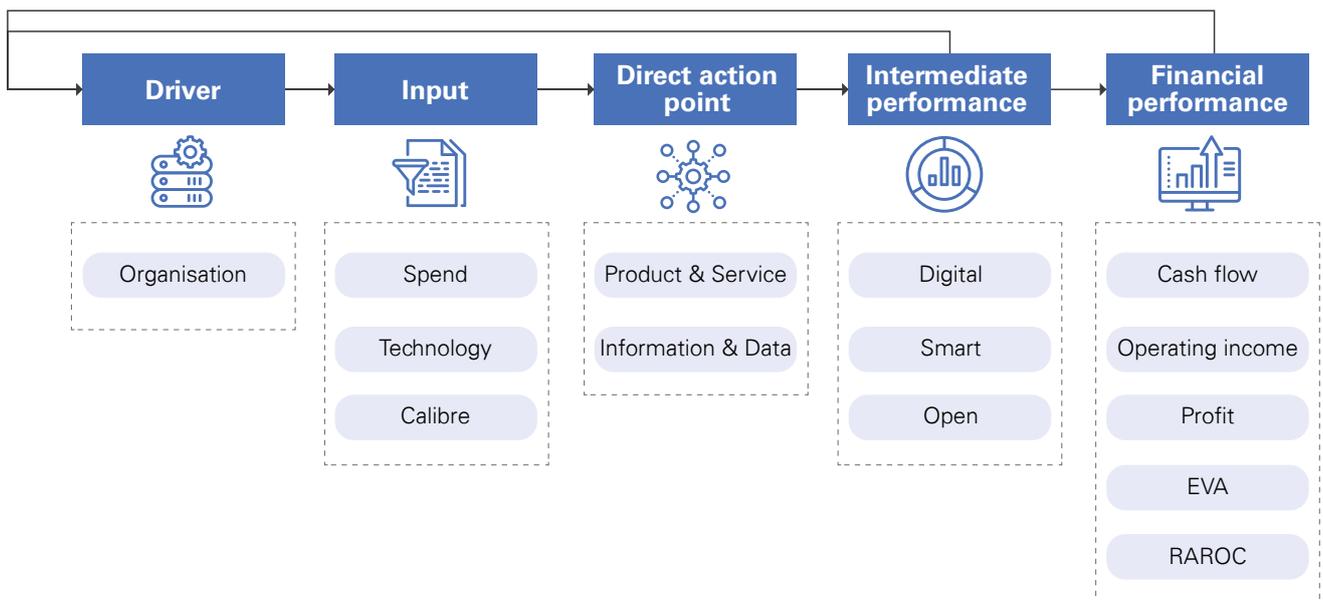
⁷ Morton, J., Stacey, P., & Mohn, M. (2018). Building and Maintaining Strategic Agility: An Agenda and Framework for Executive IT leaders. California Management Review, 61(1), 94–113.

- 3) **Technology** refers to banks’ capabilities to develop and apply distributed IT architecture, Internet, artificial intelligence (AI), blockchain, big data, cloud computing, Internet of Things, biometrics and other technologies to carry out business activities. The application of these financial technologies serves as the basis for banks to be digital and smart.
- 4) **Information and Data** refers to the scale of the data that banks are able to capture, how deeply they analyse it, and how they leverage it using their IT functions and partnerships. Information and Data is a good indicator of how digitalised and open a bank is. Strong Information and Data capabilities signify the bank’s full coverage of various channels, the depth of its business, and the openness of its operations, all of which facilitate the in-depth development of omni-channel and all-scenario digitalisation. Information and Data also serves as the foundation for future banks to build new risk management capabilities.

- 5) **Spend** represents a bank’s ability to provide the resources required for innovative transformation. Banks need to spend wisely to become more digital, smart and open.
- 6) **Calibre** is important because like all enterprises, banks need high-quality talent to develop their various lines of business. Similar to Organisation, Calibre is a prerequisite for transformation.

Within the six capabilities of the OPTICS system, Organisation is a driver. Calibre, Spend and Technology are inputs that shape Product and Service, while Information and Data affects a bank’s ability to be digital, smart and open, which ultimately translates into financial performance. However, the causal linkage between these elements is not a one-way process as performance continuously affects the driver and the inputs.

Figure 1: Relationship between OPTICS capabilities and being “digital, smart and open”



04.

The preliminary construction of OPTICS capabilities

The six OPTICS capabilities are tier 1 indicators. Tier 2 and tier 3 indicators are needed to put the system into practice.

1 Organisation

Corporate Organisation comprises **organisational structure, strategy** and **culture**, representing the three tier 2 indicators.

Future banks can acquire the ability to continuously innovate and evolve by reinventing their organisation. They can do this by designing new systems and removing systematic obstacles to innovation; setting up fintech subsidiaries, innovation laboratories, joint laboratories, incubators, and accelerators to promote technological innovation; and by cultivating new technologies, incubating new enterprises, and improving their agility and trial and error processes.⁸ For example, China Industrial Bank, China Minsheng Bank and Bank of Beijing have established fintech subsidiaries. Shanghai Pudong Development Bank (SPDB) has partnered with Shanghai Clearing House and Huawei to establish innovation laboratories, and CitiBank and DBS Bank have established fintech accelerators. As a result of this trend, there are two tier 3 indicators under this tier 2 indicator. One of them focuses internally on whether the enterprise has

any laboratories and fintech subsidiaries, and the other focuses externally on whether the enterprise has set up any incubators and accelerators.

There are two components in an organisational strategy. One is the strategic vision. An entity needs an inspiring and clear vision to maintain the ability to evolve and innovate, and management's vision determines how the strategy is implemented.⁹ A clear vision for how a bank will evolve into a future bank helps it formulate strategy, change its organisation, and motivate its people to pursue the vision. For example, the CEO of BBVA in Spain coordinates and plans innovation initiatives which are then implemented top down to establish an open and inclusive innovation mechanism and maintain the independence of traditional and innovative businesses. The other component in an organisational strategy is a clear path for strategic planning, such as an open operating strategy or digital strategy that can guide changes to the organisation. Nowadays, many banks are applying open bank or digital bank strategies. For example, Citibank has set up the Global Innovation Council, entailing senior leaders across various business lines and key functions from around the world. This group is charged with allocating resources and prioritising innovation initiatives at the companywide level. Led by Citibank's CEO, CIO

⁸ Huiya, Yao & Lei, Xu. (2019). Innovative Transformation of Small and Medium-Sized Banks Driven by Fintech (金融科技驱动下的中小银行创新转型路径). *Banking Industry in China*, (4), 78–80.

⁹ Takeuchi, H. (2013). Knowledge-Based View of Strategy. *Harvard Business Review*, (September), 68–79.

and CTO, the Council has identified six key areas of innovation. China Merchants Bank (CMB) is the first bank in China to include its percentage of fintech spending to operating income into its articles of association, and it has reorganised what was formerly the head office's Strategic Planning Department into the "Fintech Office." These two components – strategic vision and a clear path for strategic planning – are important indicators of a bank's organisational and strategic capabilities, and they represent two tier 3 indicators under organisational strategy.

Organisational innovation culture refers to the corporate system, mechanism and culture for innovation, tolerance, and trial and error. Such culture is important given the high risk of error during the innovation process. Culturally, bottom-up innovation from employees should be encouraged and errors should be tolerated so that experience can be accumulated in small but quick steps. Systematically, enterprises should implement corresponding performance appraisal and incentive measures to encourage employees to develop valuable and innovative ideas. For example, CMB's board of directors has made it clear that CMB "tolerates errors and rewards success" when developing fintech. The

Bank also provides financial and platform support such as the Fintech Innovative Project Fund and the Incubator Platform. Also, CMB organises Employee Innovation Competitions, and it disregards short-term input-output ratios. WeBank, China's first Internet bank, encourages its employees to organise new project incubator groups on their own initiative. These groups are directly and centrally managed by the Bank's Strategic Development Department, and they are given at least 2 years to run. During the first year, performance is not evaluated, and the annual performance ratings for group members are guaranteed, so they can return to their original posts even if the project fails. These measures effectively reduce the risk for employees to innovate. Therefore, the trial and error system is a tier 3 indicator. The organisational ability to innovate is also closely related to how flat and agile an organisation is. Flat structures, cross-departmental communication and cooperation, and agile teams are more conducive to effective decision-making, faster innovation and quick response to market demands.¹⁰ Thus, agility is also a tier 3 indicator.

The tier 2 and tier 3 indicators under Organisation are summarised in Table 1 below:

Table 1: Tier 2 and tier 3 indicators under Organisation

Tier 2 indicators	Tier 3 indicators	Definitions
 Organisational structure	Laboratories and fintech subsidiaries	Have fintech subsidiaries and innovation laboratories been established
	Incubators and accelerators	Have incubators or accelerators been established
 Organisational strategy	Vision	Does the bank have a clear strategic vision for how it will become digital, smart and open
	Strategic planning and path	Is there clear strategic planning and an implementation path for becoming digital, smart and open
 Organisational culture	Trial and error	Has a trial and error system been established, and does the bank's culture encourage innovation
	Agility	Is the management structure flat, is there significant cross-departmental cooperation, and are teams agile

¹⁰ Martin, J. A., & Eisenhardt, K. M. (2010). Rewiring: Cross-Business-Unit Collaborations in Multi-business Organizations. *Academy of Management Journal*, 53(2), 265–301. Wu, Y. (2015). Organizational Structure and Product Choice in Knowledge-intensive Firms. *Management Science*, 61(8), 1830–1848.

2 Product and Service

We assess Product and Service from three perspectives: **product innovation capability**; **service and operation innovation capability**; and **users**.

Product innovation capability is one of an enterprise's most important competitive edges. It is measured by the speed at which products are marketed online and the speed at which products are upgraded.

The speed at which products are marketed online measures how quickly and efficiently enterprises manufacture and develop their products, while the speed at which products are upgraded measures the ambition and strength with which enterprises optimise and change themselves. For example, WeBank spent just 11 days developing a product from concept to production; this fast turnover allows the Bank to cater to changing demands in the Internet era and seize opportunities as they arise. WeBank has also created a fintech sandbox. Using the fintech tools provided by such a sandbox, financial institutions can assemble prototypes of innovative financial solutions and repeatedly verify, test and produce various innovative solutions within the sandbox to promote digitalisation and innovation.

Service and operation innovation capability is another core competitiveness of enterprises. The banking industry values customer experience. In fact, CMB is regarded as a leader in retail banking owing to its high-quality customer experience. With the application of financial technologies like AI, the services and operations of future banks will become more intelligent, people-oriented, automated and efficient; and the average bank will be able to provide end-to-end smart services and automated operations. Specific smart services and operations commonly provided by banks include smart customer services, precise marketing, smart risk

control, smart collection, smart investment advisory, and smart operation and maintenance (O&M).

We can categorise smart services and operations into three areas: front, middle and back end. For example, customer services, marketing, collection, and investment advisory can be categorised as front end while risk control and O&M are categorised as middle and back end.

User refers to the size, activeness and range of users that bank products and services target. In this regard, user size, user growth and active users represent three tier 3 indicators. Daily active users (DAU), monthly active users (MAU), and similar metrics are basic indicators that measure the stickiness of application users in the Internet industry, and they are increasingly being adopted by banks to measure Internet products. For example, CMB has been promoting its proprietary "Life in the Palm" and CMB applications, and it is shifting from card-based operations to application-based operations. For this reason, the Bank tracks the number of active users of these applications to measure its competitiveness in the Internet era and as a basis for developing strategies. Following CMB's practice, we use MAU as a tier 3 indicator. In addition to the three tier 3 indicators, we have also created a tier 3 indicator named "inclusive finance and internationalisation" to measure bank user coverage. As competition for quality customers in the traditional market intensifies, banks must either compete for inclusive finance customers or expand into overseas markets, and both are critical battlefields where banks are embracing the future and identifying new opportunities for growth.

The tier 2 and tier 3 indicators under Product and Service are summarised in Table 2:

Table 2: Tier 2 and tier 3 indicators under Product and Service

Tier 2 indicators	Tier 3 indicators	Definitions
 Product innovation capability	Product marketing	How fast are new products marketed online
	Product upgrades	The speed and frequency of product upgrades
 Service and operation innovation capability	Smart front end	How smart are the bank's front-end operations, e.g. smart customer services, precise marketing, smart collection, smart investment advisory
	Smart middle and back end	How smart are the bank's middle and back-end operations, e.g. smart risk control, smart O&M
 Users	User size	How many users
	User growth rate	What is the user growth rate
	Active users	How many MAUs does the bank's system have
	Inclusive finance and internationalisation	Percentage of inclusive finance and internationalised business to all lines of business

3 Technology

We assess the Technology of banks from two perspectives: 1) the technological level that banks appear to have; and 2) how banks conduct R&D and apply technologies in practice.

The first perspective focuses on **intellectual property and technological credentials** such as awards, patents and standards. These indicate a bank's technological level and can be used as a tier 2 indicator. However, as awards are relatively subjective, we use patents (including software copyrights), which are more objective, as a tier 3 indicator. Patents are generally applicable to all industries and can indicate an enterprise's technological level to a large extent.¹¹ Within Internet enterprises, software copyrights are an important form of intellectual property, similar to patents. In addition, if an enterprise is involved in preparing

accepted industry technical standards, this reflects the enterprise's technical standing in the industry.¹²

The second perspective is a bank's **IT system capabilities** and its **application of cutting-edge technologies** in practice. In this regard we have established two tier 2 indicators. The first tier 2 indicator profiles how advanced a bank's IT infrastructure and core systems are. Transaction demands in the Internet era are highly concurrent and require highly reliable data in massive amounts. To highlight their competitiveness in this area, banks are increasingly treating IT infrastructure that meets the requirements of the Internet era as a basic necessity. IT system capabilities can be measured in several ways, and each aspect can be used as a tier 3 indicator:

¹¹ Griliches, Z. (1990). Patent Statistics as Economic Indicators: A Survey. *Journal of Economic Literature*, 28, 1661–1707.

¹² Blind, K. (2013). *The Impact of Standardization and Standards on Innovation*. Manchester, UK.

- 1) Distributed infrastructure. As new business models emerge in the current era, the traditional mainframe centralised IT architecture is often criticised for its hard-to-control operational stability, poor IT system legacy capability, limited business volume capacity, high cost, and great pressure on databases. In comparison, the use of distributed architecture has become a trend among large Internet enterprises and leading innovative banks owing to its high efficiency, high flexibility and low cost.¹³ Internet banks in China such as MyBank and WeBank have adopted distributed infrastructure since their inception, and large banks including CCB, ICBC and CMB have embarked on transformations in order to use distributed infrastructure in new, local, non-core businesses and regions.
- 2) Availability. Customers need financial services around the clock, so banks' systems need to be highly available. As a pillar of the national economy, the banking industry should be able to prevent failures and disasters and cut losses. To this end, banks should have disaster recovery centres in places where they operate and in other regions, and they should minimise their Recovery Point Objectives (RPO) and Recovery Time Objectives (RTO) to enhance system security and availability.
- 3) Transaction performance. In future Internet scenarios, banks will face a significant number of service requests from a large number of users across various regions, and they will need to process massive amounts of data in their daily operations. Therefore, banks will need to have significant processing capabilities that can support millions, perhaps even billions, of users. They will need to be able to handle millions of transactions per day on average and at least tens of thousands of transactions per second (TPS) at peak times.
- 4) Scalability measures how efficient and fast an organisation expands or scales the processing power and volume of its architecture to meet the requirements of Internet transactions. In the Internet era, banks will likely need to handle rapid increases in transactions during short periods of time as marketing activities roll out. Therefore, banks need to have the capacity necessary to effectively support large numbers of users and surges in marketing activities.
- 5) Operating cost. To support transactions involving a massive amount of users and handle the diversification of client segments, future banks should optimise their IT infrastructure to reduce operating cost per account to ensure profitability. This is one of the ways that emerging privately-owned banks such as MyBank and WeBank maintain their profitability while driving financial inclusion. According to estimates, the cost per customer incurred by privately-owned banks in IT O&M is lower than one-fifth of that incurred by traditional banks. While traditional commercial banks incur about RMB 10-20/year per personal banking customer in IT O&M, WeBank only incurs RMB 3.5/year. MyBank incurs about RMB 18/year per corporate banking customer in IT O&M, which is also significantly lower than its traditional peer banks.¹⁴

¹³ Henry Ma and others. (2019). A New Generation of Banking IT Architecture (新一代银行IT架构). Beijing: Machinery Industry Press.

¹⁴ Ifenxi. 2019. How Can Digital Banks Help Inclusive Finance Business Break Through the Cost Boundary? (数字银行如何助力普惠金融业务突破成本边界?) <https://mp.weixin.qq.com/s/zxYSPLY90wVuXqdmYLfzvw>.

The second tier 2 indicator measures how banks apply cutting-edge financial technologies (such as artificial intelligence, blockchain, Cloud and data) in practice. The more a bank applies technologies, the higher its level of Technology. As a result, the application of each cutting-edge financial technology

is treated as a tier 3 indicator. In addition to these technologies, security technologies and biometrics are also tier 3 indicators.

The tier 2 and tier 3 indicators under Technology are summarised in Table 3 below:

Table 3: Tier 2 and tier 3 indicators under Technology

Tier 2 indicators	Tier 3 indicators	Definitions
 Intellectual property and credentials	Patents	Number and quality of a bank’s patents and software copyrights
	Technical standards	Number and level of technical standards that a bank has been involved in preparing
 IT system capabilities	Distributed infrastructure	Whether distributed infrastructure has been adopted
	Availability	IT system availability and disaster recovery
	Scalability	Scalability of the IT system
	Transaction performance	IT system peak handling capacity
	Operating cost	IT infrastructure O&M cost per account
 Application of cutting-edge fintech	Artificial intelligence (AI)	Awareness and application of AI and scenario diversity
	Blockchain	Awareness and application of blockchain and distributed ledger technology (DLT)
	Cloud computing	Awareness and application of cloud infrastructure or cloud programs
	Big data	Awareness and application of big data technology
	Security technologies	Awareness and application of security technologies
	Biometrics	Awareness and application of biometrics



4 Information and Data

A bank's Information and Data is measured using two tier 2 indicators. First, **open capability** measures how open a bank's data and information interfaces are. This openness enables banks to construct technology and data platforms for the purposes of exchanging data and information, transmitting financial resources and technologies, and supporting the bank's scenario development, customer services and risk management. Gartner, a research and advisory company, defines "open bank" as a platform business model. A bank connects with its partners through an application programming interface (API) and software development kit (SDK), and its partners can use banking services when needed, thereby promoting the sharing of data between the parties. This is the model adopted by most of the organisations that engage in open banking in China. For example, Shanghai Pudong Development Bank released its "API Boundless Open Bank" Strategy in July 2018. As at 2018 end, SPDB had introduced a total of 230 API services that connect to the applications of 86 partners, including China UnionPay, JD Digital, Ctrip, and Vanke.¹⁵ Thus, we treat API/SDK and platform as tier 3 indicators.

The second tier 2 indicator is **connectivity**, which measures the extent to which a bank interacts and

works with external partners. Within connectivity, there are two tier 3 indicators. The first is the "alliance ecosystem," which relates to the various alliances and partnerships in which a bank is involved. When a bank is involved in more alliances and partnerships, it has stronger ecosystem construction capabilities. The ecosystem provides the resources for a future bank's development.¹⁶ The second tier 3 indicator is "channel scenario traffic". The key to a future bank's competitiveness in the Internet era lies in its ability to use multiple channels to offer banking services in various work and life scenarios. In this way, a bank can diversify its business lines and gain direct access to a larger number of users. For example, based on its "boundless scenario service" concept, CMB uses its applications to work with merchants and public service organisations to provide bus transport, convenience services, and e-commerce services. Through these applications, the Bank is able to serve customers and meet their various needs. As at 2018 end, 27.11% of the traffic recorded by CMB's applications came from non-financial services.¹⁷

The tier 2 and tier 3 indicators under Information and Data are summarised in Table 4 below:

Table 4: Tier 2 and tier 3 indicators under Information and Data

Tier 2 indicators	Tier 3 indicators	Definitions
 Open capability	API/SDK	How open are the bank's API and SDK data and information interfaces
	Platform	Does the bank have an open technology and data platform
 Connectivity	Alliance ecosystem	Extent of the bank's involvement in various alliances for the purposes of creating an ecosystem
	Channel scenario traffic	How diversified are the bank's customer acquisition channels and scenarios

¹⁵ http://www.sohu.com/a/294920025_672569

¹⁶ McKinsey & Company. (2017). The Phoenix Rises: Remaking the Bank for an Ecosystem World. McKinsey Global Banking Annual Review 2017.

¹⁷ CMB official website <http://www.cmbchina.com/cmbinfo/news/newsinfo.aspx?guid=2b7be300-121f-4b91-b0b9-708a6cf7f599>

5 Calibre

There are two tier 2 indicators under Calibre. One relates to **team composition** within the bank, which is a static indicator that reflects the quality of a bank’s employees at a given time. Under team composition, there are four tier 3 indicators that measure how much a bank values its highly educated employees, technological personnel, data analysis talent, and international talent. The other tier

2 indicator under Calibre measures how much a bank **invests in employee training**, which is a dynamic indicator that reflects a bank’s potential to improve the quality and capability of its employees.

The tier 2 and tier 3 indicators under Calibre are summarised in Table 5 below:

Table 5: Tier 2 and tier 3 indicators under Calibre

Tier 2 indicators	Tier 3 indicators	Definitions
 Team composition	Employees’ educational level	Percentage of post-graduate employees
	Technological personnel	Percentage of technological R&D personnel
	Data analytics talent	Percentage of data analytics personnel
	International talent	Percentage of international talent
 Investment in training	Investment in employee training	How much a bank invests in employee training



6 Spend

To become future banks, banks need to increase their spending (and also spend more wisely) to adapt to future changes, embrace new technologies, and build ecosystems. The first tier 2 indicator under Spend is **operating cost**, which mainly refers to a bank's investment in its IT system and R&D activities in daily operations. Operating cost measures both the total amount of the investments, and the amount of these investments as a percentage of operating income. CMB has become a leader in the industry owing to its decision to continuously increase its investment in fintech. It currently specifies that a fixed percentage of 3.5% of operating income must be invested in fintech. The second tier 2 indicator under Spend is investment cost, which measures whether a bank has established an outbound venture capital fund to invest in potential start-ups to maintain its edge in technology or business development.

Citibank has established designated functions such as innovation laboratories, start-up incubators, start-up accelerators and venture capital funds to manage various innovative lines of business. Of these, Citi Ventures is responsible for selecting and investing in start-ups. To this end, it established the D10X incubator to incubate start-ups set up by in-house employees. As at July 2018, more than 300 employees had launched 85 start-up projects. The accelerators aim to help investees connect with corresponding business functions within Citibank, and they also provide expert guidance in order to expedite deliverables.¹⁸ The tier 2 and tier 3 indicators under Spend are summarised in Table 6 below:

Table 6: Tier 2 and tier 3 indicators under Spend

Tier 2 indicators	Tier 3 indicators	Definitions
 Operating cost	IT and R&D spending	Amount and percentage of a bank's spend on its IT system and R&D activities
 Investment cost	Outbound investments	Has a bank established any outbound venture capital funds

¹⁸ Lei, Xu. (2019). Elephant's Bicycle: How Can Financial Institutions Use Accelerators to Gain a Competitive Advantage? (大象的小单车: 金融机构如何借助加速器树立竞争优势?) <https://mp.weixin.qq.com/s/rjhYuMGsbddpuW12dgLgg>

05.

Quantitative testing and revision of the indicator system

1 Testing method

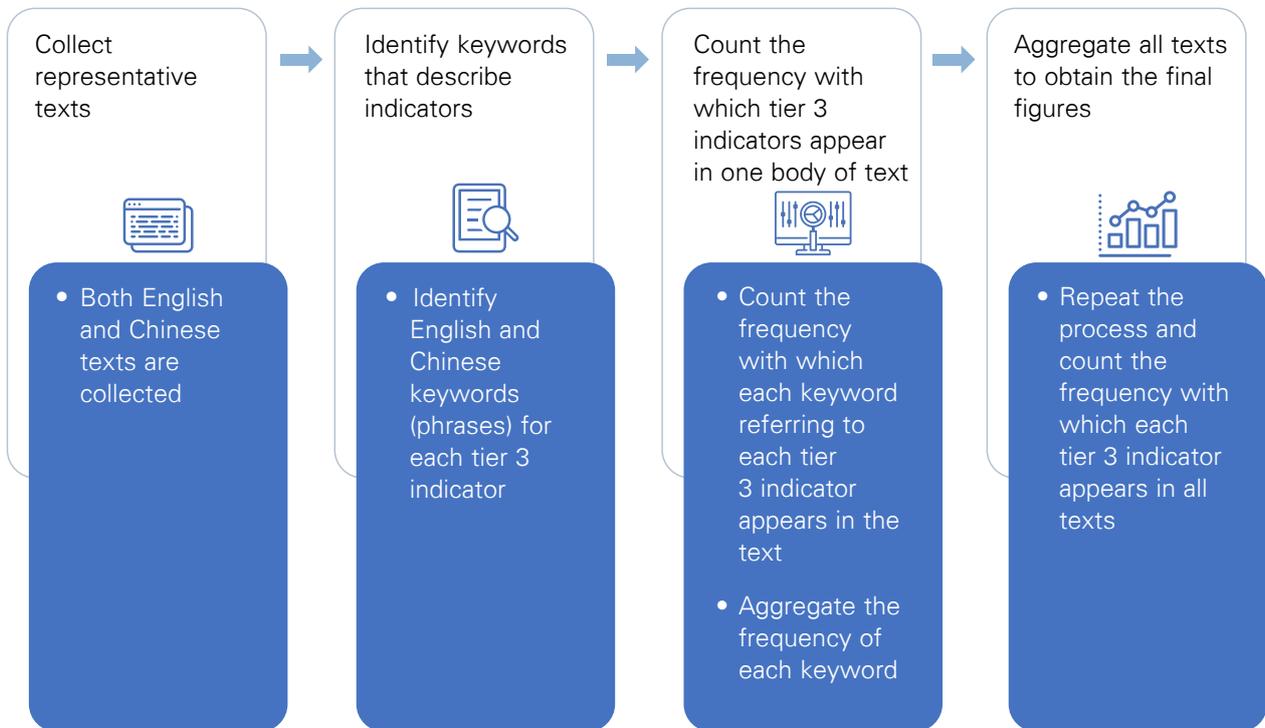
The indicator system mentioned above was established based on theoretical deduction and is supported by practical cases from the banking industry. Despite being internally logical, it is still an *a priori indicator system* ("*a priori system*") that requires testing from two perspectives: **First, are the indicators important to and generally accepted in the industry? Second, within the *a priori system*, all tier 3 indicators are grouped under tier 2 indicators, but is it proper to do so in industrial practice?**

Therefore, we hope to find evidence from industrial practices to support the reasonableness of the *a priori system*. We will make our judgement based on the following assumptions:

- 1) If an indicator frequently appears in innovative practices and dialogue in the banking industry, we assume that the indicator is important to or generally accepted by future banks;
- 2) If two or more indicators are frequently mentioned together in the industry, the indicators are likely to be closely related and should probably be grouped together.



Figure 2: Steps to test the indicators



Based on the above assumptions, we searched for the *a priori system's* tier 3 indicators in actual industry discussion scenarios. We collected 209 documents in English and Chinese, including annual reports of major banks listed in China, Europe and the US; research papers published by international consultants; and official WeChat posts and announcements released by major fintech and Internet banks in China. We then searched for keywords in these documents (if you are interested in learning more about this process, please contact the authors of this report).

In actual discussions, people may not use the exact wording to refer to a particular term. For example, when referring to the tier 3 indicator “trial and error,” expressions such as “error tolerance,” “trial,” “tolerant,” and “test” are sometimes used to describe the relevant capability and behaviour. In fact, “trial and error” is only a latent variable; the aforesaid expressions are directly observable in the texts. Likewise, the tier 3 indicator “data analytics talent” is sometimes expressed as “data analyst” or “data scientist”, for example. As a result, we

identified keywords (phrases) that clearly refer to each tier 3 indicator as much as possible, and we view them as referring to the tier 3 indicators that they represent.

As shown in Figure 2, we searched representative texts that have been written by the industry to describe future banks and innovative banks. For each tier 3 indicator, we identified keywords (phrases) that clearly refer to the indicator, and then we searched for these keywords in each text and counted the frequency with which these words (phrases) appear. The aggregated sum then indicates how frequently the tier 3 indicator appears in the text.

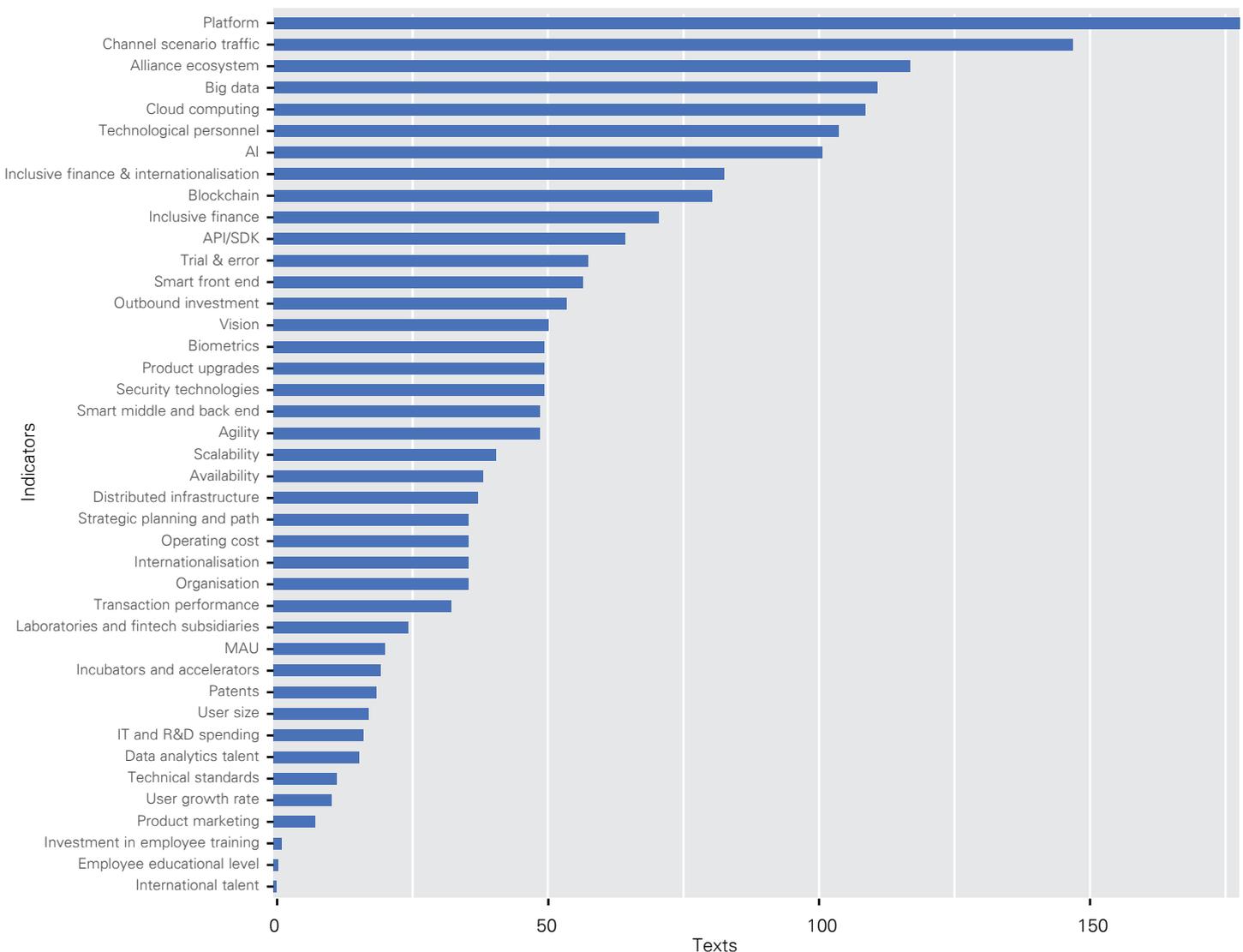
Each text is a sample, and each indicator is a variable. By performing variable cluster analysis and principal component analysis on all of the texts, we can determine which indicators are frequently mentioned by the industry and which indicators are likely to be grouped together.

2 Testing and revision results

The number of texts in which the indicators from the initially established *a priori system* appear is shown in Figure 3. Certain indicators are likely to appear in one text frequently, resulting in a large frequency sum. Therefore, we should consider how important the indicator is; we can do this by counting the number of texts in which it appears, as shown in Figure 3. The number of texts in which an indicator appears demonstrates how frequently the indicator is mentioned in various scenarios and by various institutions. If an indicator is mentioned in a large number of texts, it means the indicator is a critical measure of a future bank’s capabilities.

As shown in Figure 3, of the 37 indicators of the *a priori system*, 28 appear in more than 20 texts. In other words, 75% of the *a priori system*’s indicators are frequently mentioned in the industry, and 16 appear in more than 50 texts, indicating their relative importance. Eight indicators – data accumulation, platform, channel scenario traffic, alliance ecosystem, big data, cloud computing, technological personnel, and AI – appear in more than half the texts, indicating their high level of importance. Except for the indicators for employees’ educational level and international talent, all the *a priori system*’s indicators are mentioned in the texts, meaning they are important for future banks.

Figure 3: Number of texts in which each indicator appears



Then, we conduct a variable cluster analysis and principal component analysis to test the *a priori* system. We will either recategorise or discard indicators that do not satisfy the requirements for statistical analysis. Table 7 sets out the OPTICS capability indicators for future banks after statistical analysis and quantitative revision.

Table 7: OPTICS capability system for future banks

Tier 1 indicators	Tier 2 indicators	Tier 3 indicators	Definitions
 Organisation	Holding structure of the group	Incubators and accelerators	Has the bank established any incubators and accelerators
		Laboratories and fintech subsidiaries	Has the bank established any laboratories and fintech subsidiaries
		Outbound investments	Has the bank established any outbound venture capital funds
	Organisational strategy	Vision	Does the bank have a clear strategic vision for how it will become digital, smart and open
		Strategic planning and path	Is there clear strategic planning and an implementation path for becoming digital, smart and open
	Organisational culture	Trial and error	Has a trial and error system been established, and does the bank's culture encourage innovation
		Agility	Is the management structure flat, is there significant cross-departmental cooperation, and are teams agile
	 Product and Service	Product innovation capability	Product marketing
Product upgrades			The speed and frequency of product upgrades
Service and operation innovation capability		Smart front end	How smart are the bank's front-end operations, e.g. smart customer services, precise marketing, smart collection, smart investment advisory
		Smart middle and back end	How smart are the bank's middle and back-end operations, e.g. smart risk control, smart O&M
Users		User size	How many users
		User growth rate	What is the user growth rate
		Active users	How many MAUs does the bank's system have
		Inclusive finance and internationalisation	Percentage of inclusive finance and internationalised business to all lines of business

Tier 1 indicators	Tier 2 indicators	Tier 3 indicators	Definitions
 Technology	IT system capabilities	Innovative architecture	Whether innovative architecture, such as distributed infrastructure, has been adopted
		Availability	IT system availability and disaster recovery
		Scalability	Scalability of the IT system
		Transaction performance	IT system peak handling capacity
		Operating cost	IT infrastructure O&M cost per account
	Application of cutting-edge fintech	Artificial intelligence	Awareness and application of AI and scenario diversity
		Blockchain	Awareness and application of blockchain and distributed ledger technology (DLT)
		Cloud computing	Awareness and application of cloud infrastructure or cloud programs
		Big data	Awareness and application of big data technology
		Security technologies	Awareness and application of security technologies
		Biometrics	Awareness and application of biometrics
 Information and Data	Open capability	API/SDK	How open are the bank's API and SDK data and information interfaces
		Platform	Does the bank have an open technology and data platform
	Connectivity	Alliance ecosystem	Extent of the bank's involvement in various alliances and partnerships for the purposes of creating an ecosystem
	Channels	Channel scenario traffic	How diversified are the bank's customer acquisition channels and scenarios
 Calibre	IT talent	Technological personnel	How much the bank needs or values technological R&D personnel
	Data analytics talent	Data analytics talent	How much the bank needs or values data analysis talent
	Investment in training	Investment in employee training	How much the bank invests in employee training
 Spend	Operating cost	IT and R&D spending	Amount and percentage of a bank's spend on its IT system and R&D activities

06.

Conclusion

1 The OPTICS capability system is not a benchmark. It is a roadmap established at the present time that will guide banks into the future.

Today, as banks are moving fast towards becoming digital, smart and open, we need an indicator system besides the traditional indicator systems that are designed for regulatory purposes. This new indicator system should cater to the innovative development of future banks and guide banks in building capabilities that enable them to achieve success in the future. To this end, we have designed the OPTICS system based on six dimensions – Technology, Organisation, Product and Service, Information and Connectivity, Calibre, and Spend – to demonstrate the capabilities that a bank needs to succeed in the future.

The OPTICS banking capability system aims to guide banks and provide a useful framework for their innovative development. This system is not a benchmark for ranking purposes; it is a roadmap for guiding the development and transformation of banks in the era of mobile Internet and fintech. It is a kind of magnifying glass that helps us more clearly see our weaknesses and strengths, understand where we are now, and determine where we need to go. In addition, we might also say that it is a telescope that helps us see into the future and view the road leading to innovative development. Established at this moment and looking toward the future, OPTICS helps us understand both current inadequacies and future expectations.

2 The OPTICS system's implications for the global banking industry

The banking sector is experiencing rapid and significant change worldwide. Barriers to entry have historically been high, and success for banks has generally been assessed on their ability to ensure prudent risk management. However, new business models are fast emerging in the sector and competition is intensifying, with virtual banks and tech companies entering the market and challenging the traditional banks. These new entrants are raising the bar for customer experience by leveraging best practices from their respective industries and applying it to the banking sector. Traditional banks therefore need to embrace innovation and broaden their capabilities in order to remain competitive going forward.

A bank's innovation capabilities are crucial for a range of stakeholders, including banks' senior management, investors and regulators. Senior management at banks will need to measure the extent of their innovation capabilities to understand how effective they are and identify areas where they need to focus their innovation efforts. Investors will want to know which banks are better equipped to innovate and therefore more likely to be successful and competitive going forward. Investors can also look beyond financial metrics and use innovation capabilities as a useful measurement to compare banks. Regulators should also be interested because the level of innovation indicates the ability of a bank to protect its depositors and ensure its long-term competitiveness.

It is clear that the skills and attributes needed for success in the banking sector are changing, with a bank's level of innovation becoming a pivotal factor. This is where the OPTICS system fits in. While traditional models are still necessary, they tend to be more backward looking, focusing on historic traditional measures of financial strength. The

OPTICS system provides a more forward-looking framework, as well as valuable insight into a bank's capacity for innovation. The system also enables banks to become more scenario-based and more effectively tailor products and services to customer needs. This is particularly important as the next generation of customers will have different banking needs and preferences.

As banks accelerate their digitalisation transformation initiatives, they should consider adopting technologies such as regulatory technology (Regtech) across their front, middle and back offices to improve efficiency. With Regtech helping to automate many traditionally manual processes, this should enable banks' senior management to focus more of their time and effort on their innovation strategy and capabilities.

Importantly, the readiness of banks to be able to embrace innovation is key. Banks' innovation aspirations must be supported by the right infrastructure, technology and data strategy – and related technical capabilities – to ensure that they are able to effectively implement their innovation strategy.

Overall, the pace of change in banking is expected to accelerate. It is not just traditional measurements such as financial strength and risk management abilities that will determine a bank's success in the future. Instead, success will increasingly be defined by a bank's ability to innovate. The banks that do not truly pursue innovation will slowly but surely find themselves in a position where they are no longer competitive or relevant, with a shrinking market share and customer base. The banks that truly embrace innovation – aided by the OPTICS system – are likely to emerge as the market leading banks of the future.

References

- ¹ CAMELS refers to Capital Adequacy, Asset Quality, Management Capability, Earnings, Liquidity and Sensitivity.
- ² King, B. (2018). Bank 4.0. Wiley.
- ³ Skinner, C. (2014). Digital Bank: Strategies to Launch or Become a Digital Bank. Marshall Cavendish International (Asia) Pte Ltd.
- ⁴ King, B. (2018). Bank 4.0. Wiley. “Bank 1.0” refers to the traditional model whereby banks rely on offline physical networks to provide services. “Bank 2.0” refers to the stage in which banks shift to electronic and online channels to provide services. “Bank 3.0” refers to the stage when banking operations become intelligent and automated.
- ⁵ AliResearch. (2017). Digital Economy 2.0.
- ⁶ Siqi, Li. (2018). Open Bank: the Innovator behind the Innovator (开放银行: 创新者背后的创新者). See “WeiInsights” https://mp.weixin.qq.com/s/jGczZE_Jzc1jMWvlfuL1Sg
- ⁷ Morton, J., Stacey, P., & Mohn, M. (2018). Building and Maintaining Strategic Agility: An Agenda and Framework for Executive IT leaders. California Management Review, 61(1), 94–113.
- ⁸ Huiya, Yao & Lei, Xu. (2019). Innovative Transformation of Small and Medium-Sized Banks Driven by Fintech (金融科技驱动下的中小银行创新转型路径). Banking Industry in China, (4), 78–80.
- ⁹ Takeuchi, H. (2013). Knowledge-Based View of Strategy. Harvard Business Review, (September), 68–79.
- ¹⁰ Martin, J. A., & Eisenhardt, K. M. (2010). Rewiring: Cross-Business-Unit Collaborations in Multi-business Organizations. Academy of Management Journal, 53(2), 265–301. Wu, Y. (2015). Organizational Structure and Product Choice in Knowledge-intensive Firms. Management Science, 61(8), 1830–1848.
- ¹¹ Griliches, Z. (1990). Patent Statistics as Economic Indicators: A Survey. Journal of Economic Literature, 28, 1661–1707.
- ¹² Blind, K. (2013). The Impact of Standardization and Standards on Innovation. Manchester, UK.
- ¹³ Henry Ma and others. (2019). A New Generation of Banking IT Architecture (新一代银行IT架构). Beijing: Machinery Industry Press.
- ¹⁴ Ifenxi. 2019. How Can Digital Banks Help Inclusive Finance Business Break Through the Cost Boundary? (数字银行如何助力普惠金融业务突破成本边界?) <https://mp.weixin.qq.com/s/zxYSPLY90wVuXqdmYLflzw> .
- ¹⁵ http://www.sohu.com/a/294920025_672569
- ¹⁶ McKinsey & Company. (2017). The Phoenix Rises: Remaking the Bank for an Ecosystem World. McKinsey Global Banking Annual Review 2017.
- ¹⁷ CMB official website <http://www.cmbchina.com/cmbinfo/news/newsinfo.aspx?guid=2b7be300-121f-4b91-b0b9-708a6cf7f599>
- ¹⁸ Lei, Xu. (2019). Elephant’s Bicycle: How Can Financial Institutions Use Accelerators to Gain a Competitive Advantage? (大象的小单车: 金融机构如何借助加速器树立竞争优势?) <https://mp.weixin.qq.com/s/r-jhyuMGsbddpuW12dglGg>



Contact us

Producers

Henry Ma, Dennis Gao

Authors

Lei Xu, Benjamin Li, Alizze Liu, Ismail Ma

Email

weinsights@webank.com

Organisers

Huiya Yao, Jason He

Designers

Sherry Deng, Isabella Hung

Ricky Wong

Senior Partner, Southern China
KPMG China
+86 (20) 3813 8833
ricky.wong@kpmg.com

Simon Gleave

Regional Head of Financial Services
KPMG Asia Pacific
+86 (10) 8508 7007
simon.gleave@kpmg.com

Paul McSheaffrey

Head of Banking & Capital Markets, Hong Kong
KPMG China
+852 2978 8236
paul.mcsheaffrey@kpmg.com

James O'Callaghan

Head of Technology Consulting, Hong Kong
KPMG China
+852 2143 8866
james.ocallaghan@kpmg.com

Jason He

Head of Banking Emerging Technology
KPMG China
+86 (755) 2547 1129
jason.rk.he@kpmg.com

Terence Fong

Head of Chinese Banks, Hong Kong
KPMG China
+852 2978 8953
terence.fong@kpmg.com

Dennis Gao

Partner, Management Consulting
KPMG China
+86 (20) 3813 8488
dennis.gao@kpmg.com

Stanley Sum

Partner, Advisory, Management Consulting
KPMG China
+852 2143 8808
stanley.sum@kpmg.com

Alizze Liu

Director, Management Consulting
KPMG China
+86 (755) 2547 3595
alizze.liu@kpmg.com

Ismail Ma

Associate Director, Management Consulting
KPMG China
+86 (755) 2547 3467
ismail.ma@kpmg.com



金融科技 · 微洞察

The information contained herein is of a general nature and is not intended to address the circumstances of any particular individual or entity. Although we endeavour to provide accurate and timely information, there can be no guarantee that such information is accurate as of the date it is received or that it will continue to be accurate in the future. No one should act upon such information without appropriate professional advice after a thorough examination of the particular situation.

Copyright © 2014-2020 WeBank. All rights reserved.

© 2020 KPMG, a Hong Kong partnership and a member firm of the KPMG global organisation of independent member firms affiliated with KPMG International Limited ("KPMG International"), a private English company limited by guarantee. All rights reserved. Printed in Hong Kong, China.

The KPMG name and logo are registered trademarks or trademarks of KPMG International.

Publication number: HK-FS20-0005

Publication date: November 2020