

Building the AI bank of the future

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Global Banking Practice

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To thrive in the AI-powered digital age, banks will need an AI-and-analytics capability stack that delivers intelligent, personalized solutions and distinctive experiences at scale in real time.

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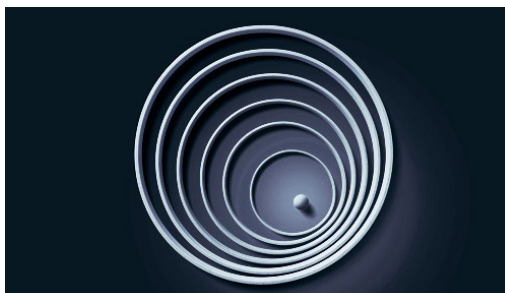
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Introduction

Banking is at a pivotal moment. Technology disruption and consumer shifts are laying the basis for a new S-curve for banking business models, and the COVID-19 pandemic has accelerated these trends. Building upon this momentum, the advancement of artificial-intelligence (AI) technologies within financial services offers banks the potential to increase revenue at lower cost by engaging and serving customers in radically new ways, using a new business model we call “the AI bank of the future.” The articles collected here outline key milestones on a path we believe can lead banks to deeper customer relationships, expanded market share, and stronger financial performance.

The opportunity for a new business model comes as banks face daunting challenges on multiple fronts. In capital markets, many banks trade at a 50 percent discount to book, and approximately three-quarters of banks globally earn returns on equity that do not cover their cost of equity.¹ Traditional banks also face diverse competitive threats from neobanks and nonbank challengers. Leading financial institutions are already leveraging AI for split-second loan approvals, biometric authentication, and virtual assistants, to name just a few examples. Fintech and other digital-commerce innovators are steadily disintermediating banks from crucial aspects of customer relationships, and large tech companies are incorporating payments and, in some cases, lending capabilities to attract more users with an ever-broader range of services. Further, as customers conduct a growing share of their daily transactions through digital channels, they are becoming accustomed to the ease, speed, and personalized service offered by digital natives, and their expectations of banks are rising.

To compete and thrive in this challenging environment, traditional banks will need to build a new value proposition founded upon leading-edge AI-and-analytics capabilities. They must become “AI first” in their strategy and operations. Many bank

leaders recognize that the economies of scale afforded to organizations that efficiently deploy AI technologies will compel incumbents to strengthen customer engagement each day with distinctive experiences and superior value propositions. This value begins with intelligent, highly personalized offers and extends to smart services, streamlined omnichannel journeys, and seamless embedding of trusted bank functionality within partner ecosystems. From the customer’s point of view, these are key features of an AI bank.

The building blocks of an AI bank

Our goal in this compendium is to give banking leaders an end-to-end view of an AI bank’s full stack capabilities and examine how these capabilities cut across four layers: engagement, AI-powered decision making, core technology and data infrastructure, and a platform-based operating model.

In our first article, “AI-bank of the future: Can banks meet the challenge?” we take a closer look at the trends and challenges leading banks to take an AI-first approach as they define their core value proposition. We continue by considering a day in the life of a retail consumer and small-business owner transacting with an AI bank. Then we summarize the requirements for each layer of the AI-and-analytics capability stack.

The second article, “Reimagining customer engagement for the AI bank of the future,” examines the capabilities that enable a bank to provide customers with intelligent offers, personalized solutions, and smart servicing within omnichannel journeys across bank-owned platforms and partner ecosystems.

In our third article, “AI-powered decision making for the bank of the future,” we examine how machine-learning models can significantly enhance customer

¹ “A test of resilience: Banking through the crisis, and beyond,” Global Banking Annual Review, December 2020, McKinsey.com.

experiences and bank productivity, and we outline the steps banks can follow to build the architecture required to generate real-time analytical insights and translate them into messages addressing precise customer needs.

The fourth article, “Beyond digital transformations: Modernizing core technology for the AI bank of the future,” discusses the key elements required for the backbone of the capability stack, including automated cloud provisioning and an API and streaming architecture to enable continuous, secure data exchange between the centralized data infrastructure and the decisioning and engagement layers.

As we discuss in our final article, “Platform operating model for the AI bank of the future,” deploying these AI-and-analytics capabilities efficiently at scale requires cross-functional business-technology platforms comprising agile teams and new technology talent.

Starting the journey

To get started on the transformation, bank leaders should formulate the organization's strategic goals for the AI-enabled digital age and evaluate how AI technologies can support these goals.

Once bank leaders have established their AI-first vision, they will need to chart a road map detailing the discrete steps for modernizing enterprise technology and streamlining the end-to-end stack. Joint business-technology owners of customer-facing solutions should assess the potential of emerging technologies to meet precise customer needs and prioritize technology initiatives with the greatest potential impact on customer experience and value for the bank. We also recommend that banks consider leveraging partnerships for non-differentiating capabilities while devoting capital resources to in-house development of capabilities that set the bank apart from the competition.

Building the AI bank of the future will allow institutions to innovate faster, compete with digital natives in building deeper customer relationships at scale, and achieve sustainable increases in profits and valuations in this new age. We hope the following articles will help banks establish their vision and craft a road map for the journey.



Renny Thomas



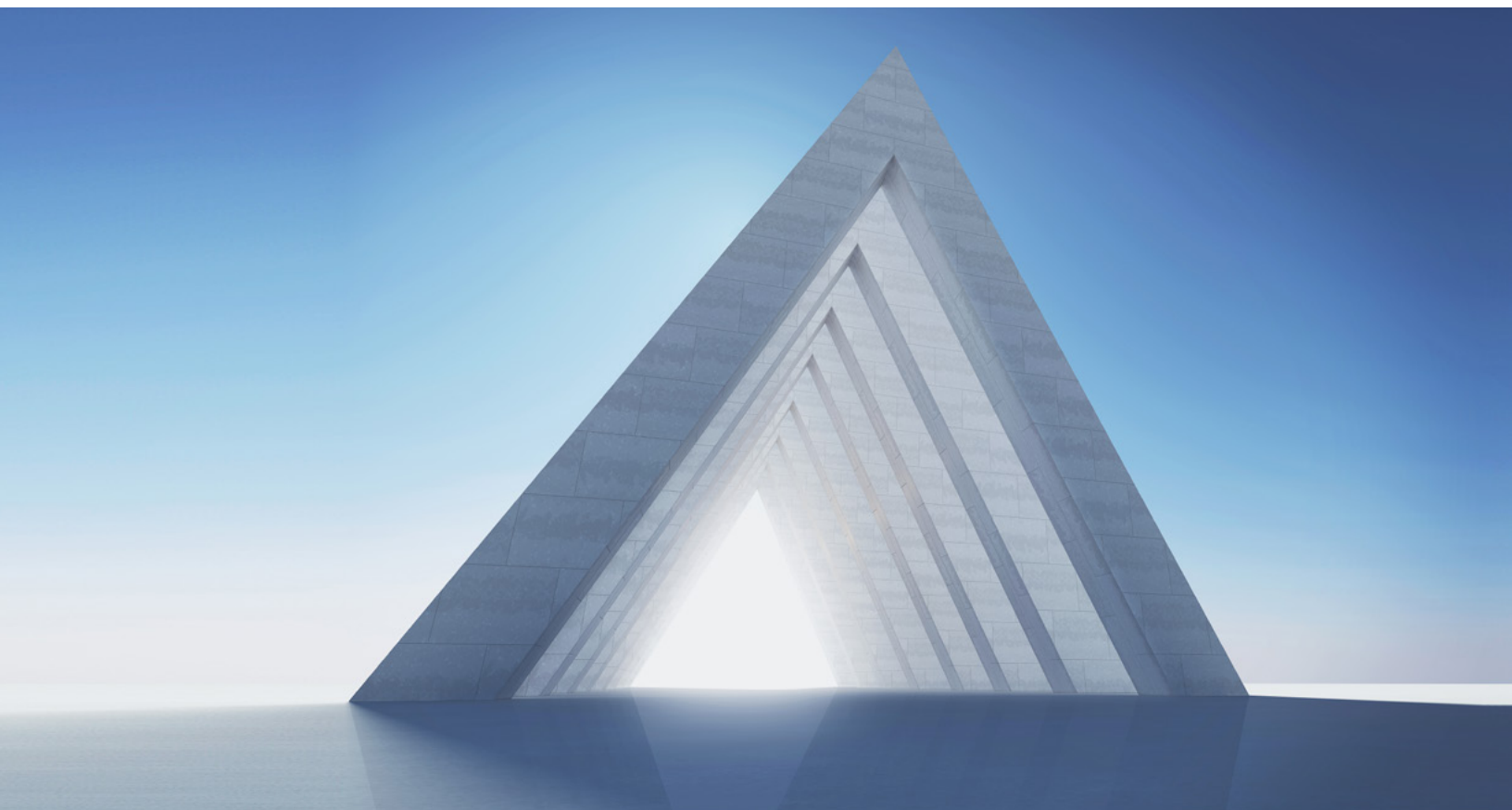
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AI bank of the future: Can banks meet the AI challenge?

Artificial intelligence technologies are increasingly integral to the world we live in, and banks need to deploy these technologies at scale to remain relevant. Success requires a holistic transformation spanning multiple layers of the organization.

by Suparna Biswas, Brant Carson, Violet Chung, Shwaitang Singh, and Renny Thomas



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In 2016, AlphaGo, a machine, defeated 18-time world champion Lee Sedol at the game of Go, a complex board game requiring intuition, imagination, and strategic thinking—abilities long considered distinctly human. Since then, artificial intelligence (AI) technologies have advanced even further,¹ and their transformative impact is increasingly evident across industries. AI-powered machines are tailoring recommendations of digital content to individual tastes and preferences, designing clothing lines for fashion retailers, and even beginning to surpass experienced doctors in detecting signs of cancer. For global banking, McKinsey estimates that AI technologies could potentially deliver up to \$1 trillion of additional value each year.²

Many banks, however, have struggled to move from experimentation around select use cases to scaling AI technologies across the organization. Reasons include the lack of a clear strategy for AI, an inflexible and investment-starved technology core, fragmented data assets, and outmoded operating models that hamper collaboration between business and technology teams. What is more, several trends in digital engagement have accelerated during the COVID-19 pandemic, and big-tech companies are looking to enter financial services as the next adjacency. To compete successfully and thrive, incumbent banks must become “AI-first” institutions, adopting AI technologies as the foundation for new value propositions and distinctive customer experiences.

In this article, we propose answers to four questions that can help leaders articulate a clear vision and develop a road map for becoming an AI-first bank:

1. Why must banks become AI first?
2. What might the AI bank of the future look like?

3. What obstacles prevent banks from deploying AI capabilities at scale?
4. How can banks transform to become AI first?

1. Why must banks become AI first?

Over several decades, banks have continually adapted the latest technology innovations to redefine how customers interact with them. Banks introduced ATMs in the 1960s and electronic, card-based payments in the '70s. The 2000s saw broad adoption of 24/7 online banking, followed by the spread of mobile-based “banking on the go” in the 2010s.

Few would disagree that we're now in the AI-powered digital age, facilitated by falling costs for data storage and processing, increasing access and connectivity for all, and rapid advances in AI technologies. These technologies can lead to higher automation and, when deployed after controlling for risks, can often improve upon human decision making in terms of both speed and accuracy. The potential for value creation is one of the largest across industries, as AI can potentially unlock \$1 trillion of incremental value for banks, annually (Exhibit 1).

Across more than 25 use cases,³ AI technologies can help **boost revenues** through increased personalization of services to customers (and employees); **lower costs** through efficiencies generated by higher automation, reduced errors rates, and better resource utilization; and **uncover new and previously unrealized opportunities** based on an improved ability to process and generate insights from vast troves of data.

More broadly, disruptive AI technologies can dramatically improve banks' ability to achieve four key outcomes: higher profits, at-scale personalization, distinctive omnichannel

¹ AI can be defined as the ability of a machine to perform cognitive functions associated with human minds (e.g., perceiving, reasoning, learning, and problem solving). It includes various capabilities, such as machine learning, facial recognition, computer vision, smart robotics, virtual agents, and autonomous vehicles. See “Global AI Survey: AI proves its worth, but few scale impact,” November 2019, McKinsey.com.

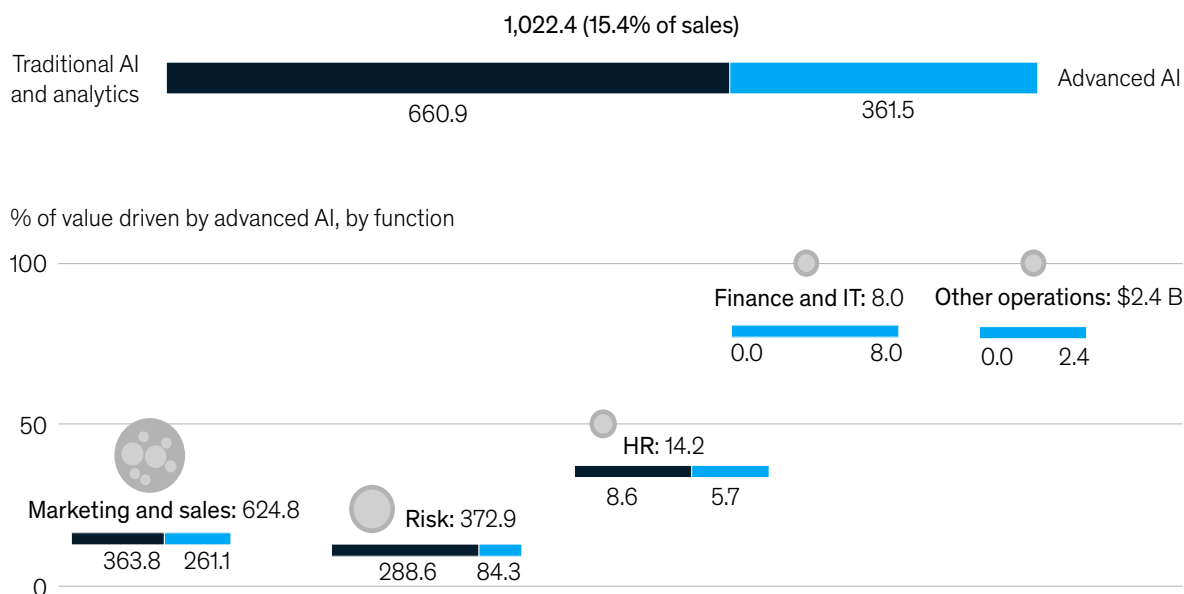
² “The executive's AI playbook,” McKinsey.com.

³ For an interactive view, visit: www.mckinsey.com/business-functions/mckinsey-analytics/our-insights/the-executives-ai-playbook?page=industries/banking/

Exhibit 1

Potential annual value of AI and analytics for global banking could reach as high as \$1 trillion.

Total potential annual value, \$ billion



Source: "The executive's AI playbook," McKinsey.com. (See "Banking," under "Value & Assess.")

experiences, and rapid innovation cycles. Banks that fail to make AI central to their core strategy and operations—what we refer to as becoming “AI-first”—will risk being overtaken by competition and deserted by their customers. This risk is further accentuated by four current trends:

- **Rising customer expectations as adoption of digital banking increases.** In the first few months of the COVID-19 pandemic, use of online and mobile banking channels across countries has increased by an estimated 20 to 50 percent and is expected to continue at this higher level once the pandemic subsides. Across diverse global markets, between 15 and 45 percent of consumers expect to cut back on branch visits following the end of the crisis.⁴

As consumers increase their use of digital banking services, they grow to expect more, particularly when compared to the standards they are accustomed to from leading consumer-internet companies. Meanwhile, these digital experience leaders continuously raise the bar on personalization, to the point where they sometimes anticipate customer needs before the customer is aware of them, and offer highly-tailored services at the right time, through the right channel.

- **Leading financial institutions' use of advanced AI technologies is steadily increasing.** Nearly 60 percent of financial-services sector respondents in McKinsey's Global AI Survey report⁵ that their companies have embedded

⁴ John Euart, Nuno Ferreira, Jonathan Gordon, Ajay Gupta, Atakan Hilal, Olivia White, "A global view of financial life during COVID-19—an update," July 2020, McKinsey.com.

⁵ Arif Cam, Michael Chui, Bryce Hall, "Global AI Survey: AI proves its worth, but few scale impact," November 2019, McKinsey.com.

at least one AI capability. The most commonly used AI technologies are: *robotic process automation* (36 percent) for structured operational tasks; *virtual assistants or conversational interfaces* (32 percent) for customer service divisions; and *machine learning techniques* (25 percent) to detect fraud and support underwriting and risk management. While for many financial services firms, the use of AI is episodic and focused on specific use cases, an increasing number of banking leaders are taking a comprehensive approach to deploying advanced AI, and embedding it across the full lifecycle, from the front- to the back-office (Exhibit 2).

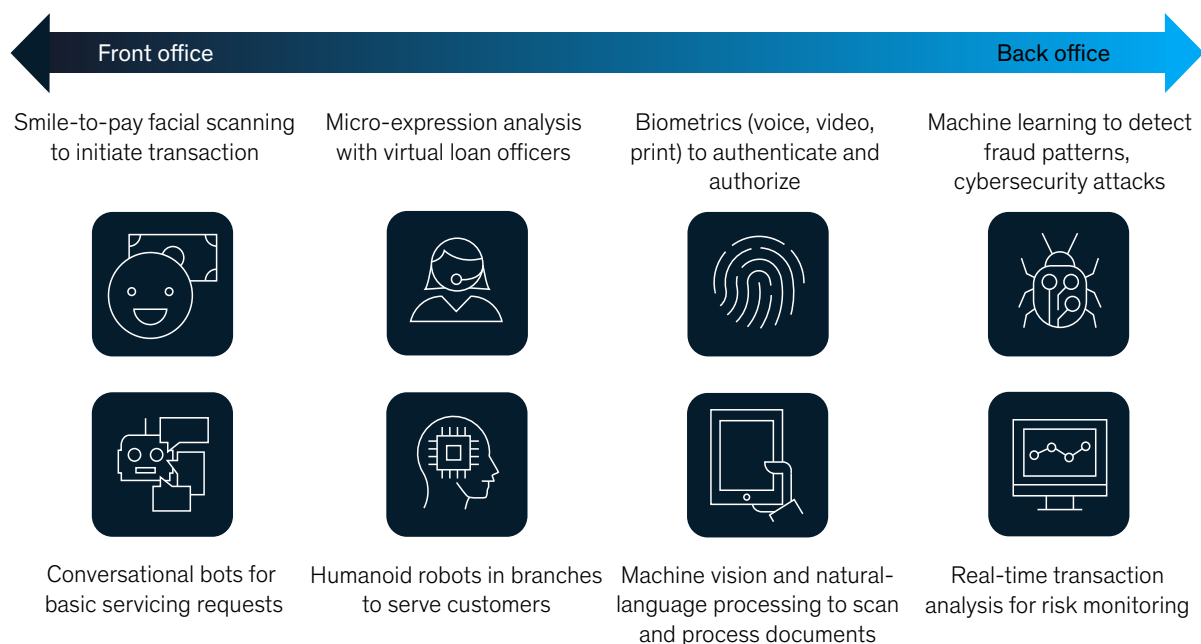
- **Digital ecosystems are disintermediating traditional financial services.** By enabling access to a diverse set of services through a common access point, digital ecosystems have transformed the way consumers discover, evaluate, and purchase goods and services. For example, WeChat users in China can use the same app not only to exchange messages,

but also to book a cab, order food, schedule a massage, play games, send money to a contact, and access a personal line of credit. Similarly, across countries, nonbanking businesses and “super apps” are embedding financial services and products in their journeys, delivering compelling experiences for customers, and disrupting traditional methods for discovering banking products and services. As a result, banks will need to rethink how they participate in digital ecosystems, and use AI to harness the full power of data available from these new sources.

- **Technology giants are entering financial services as the next adjacency to their core business models.** Globally, leading technology giants have built extraordinary market advantages: a large and engaged customer network; troves of data, enabling a robust and increasingly precise understanding of individual customers; natural strengths in developing and scaling innovative technologies (including AI); and access to

Exhibit 2

Banks are expanding their use of AI technologies to improve customer experiences and back-office processes.



low-cost capital. In the past, tech giants have aggressively entered into adjacent businesses in search of new revenue streams and to keep customers engaged with a fresh stream of offerings. Big-tech players have already gained a foothold in financial services in select domains (especially in payments and, in some cases, lending and insurance), and they may soon look to press their advantages to deepen their presence and build greater scale.

2. What might the AI bank of the future look like?

To meet customers' rising expectations and beat competitive threats in the AI-powered

digital era, the AI-first bank will offer propositions and experiences that are *intelligent* (that is, recommending actions, anticipating and automating key decisions or tasks), *personalized* (that is, relevant and timely, and based on a detailed understanding of customers' past behavior and context), and truly *omnichannel* (seamlessly spanning the physical and online contexts across multiple devices, and delivering a consistent experience) and that blend banking capabilities with relevant products and services beyond banking. Exhibit 3 illustrates how such a bank could engage a retail customer throughout the day. Exhibit 4 shows an example of the banking experience of a small-business owner or the treasurer of a medium-size enterprise.

Exhibit 3

How AI transforms banking for a retail customer.

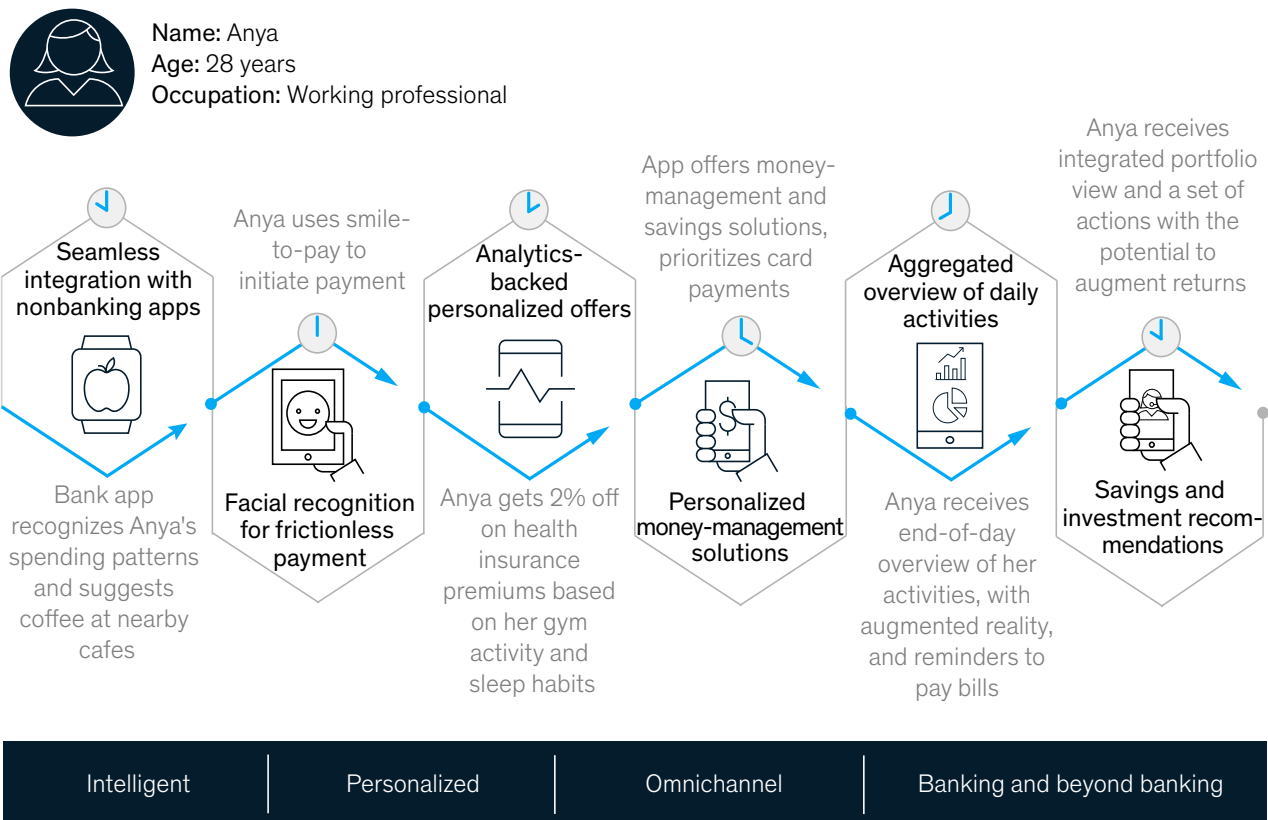
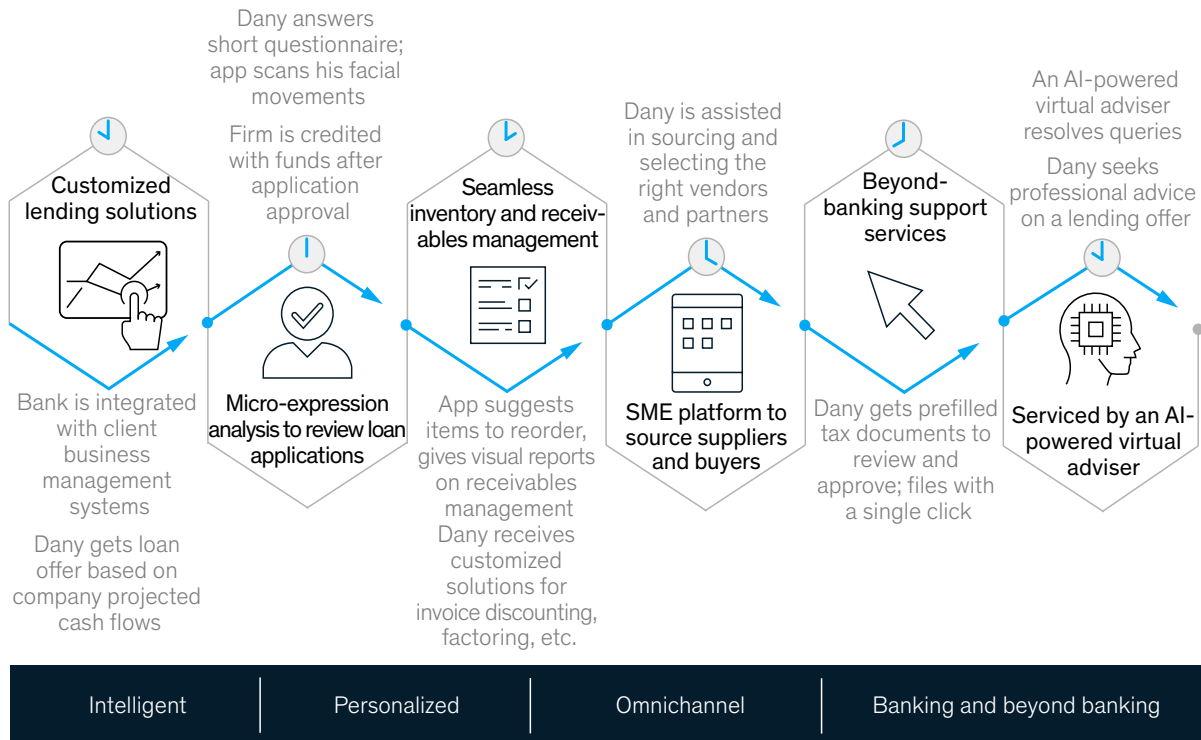


Exhibit 4

How AI transforms banking for a small- or medium-size-enterprise customer.



Name: Dany
Age: 36 years
Occupation: Treasurer of a small manufacturing unit



Internally, the AI-first institution will be optimized for operational efficiency through extreme automation of manual tasks (a “zero-ops” mindset) and the replacement or augmentation of human decisions by advanced diagnostic engines in diverse areas of bank operations. These gains in operational performance will flow from broad application of traditional and leading-edge AI technologies, such as machine learning and facial recognition, to analyze large and complex reserves of customer data in (near) real time.

The AI-first bank of the future will also enjoy the speed and agility that today characterize digital-native companies. It will innovate rapidly, launching new features in days or weeks instead of months. It will collaborate extensively with partners to deliver new value propositions integrated seamlessly across journeys, technology platforms, and data sets.

3. What obstacles prevent banks from deploying AI capabilities at scale?

Incumbent banks face two sets of objectives, which on first glance appear to be at odds. On the one hand, banks need to achieve the speed, agility, and flexibility innate to a fintech. On the other, they must continue managing the scale, security standards, and regulatory requirements of a traditional financial-services enterprise.

Despite billions of dollars spent on change-the-bank technology initiatives each year, few banks have succeeded in diffusing and scaling AI technologies throughout the organization. Among the obstacles hampering banks' efforts, the most common is the lack of a clear strategy for AI.⁶ Two additional challenges for many banks are, first, a weak core technology and data backbone and, second, an outmoded operating model and talent strategy.

Built for stability, banks' core technology systems have performed well, particularly in supporting traditional payments and lending operations. However, banks must resolve several weaknesses inherent to legacy systems before they can deploy AI technologies at scale (Exhibit 5). First and foremost, these systems often lack the capacity and flexibility required to support the variable computing requirements, data-processing needs, and real-time analysis that closed-loop AI applications require.⁷ Core systems are also difficult to change, and their maintenance requires significant resources. What is more, many banks' data reserves are fragmented across multiple silos (separate business and technology teams), and analytics efforts are focused narrowly on stand-alone use

cases. Without a centralized data backbone, it is practically impossible to analyze the relevant data and generate an intelligent recommendation or offer at the right moment. If data constitute the bank's fundamental raw material, the data must be governed and made available securely in a manner that enables analysis of data from internal and external sources at scale for millions of customers, in (near) real time, at the "point of decision" across the organization. Lastly, for various analytics and advanced-AI models to scale, organizations need a robust set of tools and standardized processes to build, test, deploy, and monitor models, in a repeatable and "industrial" way.

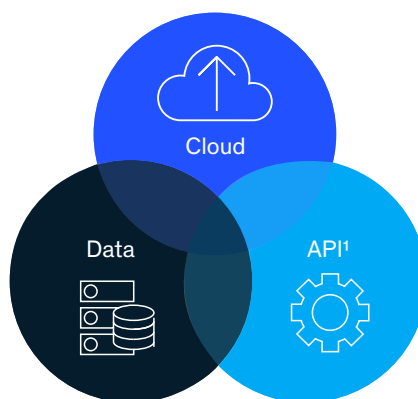
Banks' traditional operating models further impede their efforts to meet the need for continuous innovation. Most traditional banks are organized around distinct business lines, with centralized technology and analytics teams structured as cost centers. Business owners define goals unilaterally, and alignment with the enterprise's technology and analytics strategy (where it exists) is often weak or inadequate. Siloed working teams and "waterfall" implementation processes invariably lead to delays, cost overruns, and suboptimal performance. Additionally, organizations lack a test-and-learn mindset and robust feedback loops that promote rapid experimentation and iterative improvement. Often unsatisfied with the performance of past projects and experiments, business executives tend to rely on third-party technology providers for critical functionalities, starving capabilities and talent that should ideally be developed in-house to ensure competitive differentiation.

⁶ Michael Chui, Sankalp Malhotra, "AI adoption advances, but foundational barriers remain," November 2018, McKinsey.com.

⁷ "Closed loop" refers to the fact that the models' intelligence is applied to incoming data in near real time, which in turn refines the content presented to the user in near real time.

Exhibit 5

Investments in core tech are critical to meet increasing demands for scalability, flexibility, and speed.



Challenges

Core/legacy systems **can't scale** sufficiently (eg, 150+ transactions/second)

Significant **time, effort, and team sizes required** to maintain infrastructure

Long **time required** to provision environments for development and testing (eg, 40+ days in some cases)

How cloud computing can help

Enables **higher scalability, resilience of services and platforms** through virtualization of infrastructure

Reduces IT overhead, enables **automation** of several **infrastructure-management tasks**, and allows development teams to "self-serve"

Enables **faster time to market**; dramatically **reduces time by providing managed services** (e., setting up new environments in minutes vs days)

Challenges

High **error rates**; poor **refresh rates**; lack of **golden source of truth**

Hard to access in a **timely fashion** for various use cases

Data **trapped in silos** across multiple units and **hard to integrate with external sources**

How best-in-class data management can help

Ensures high degree of accuracy and **single source of truth** in a cost-effective manner

Enables **timely** and **role-appropriate access for various use cases** (eg, regulatory, business intelligence at scale, advanced analytics and machine learning, exploratory)

Enables a **360-degree view across the organization** to enable generation of **deeper insights** by decision-making algorithms and models

Challenges

Longer time to market, limited reusability of code and software across internal teams

Hard to partner or collaborate with external partners; long time to integrate

Suboptimal user experience—hard to stitch data and services across multiple functional siloes for an integrated proposition

How APIs can help

Promote reusability and **accelerate development** by enabling access to granular services (internal and external)

Reduce complexity and **enable faster collaboration** with external partners

Enhance **customer experience** by **enabling timely access** to data and services across different teams; faster time to market due to **limited coordination, cross-team testing**

¹Application programming interface.

4. How can banks transform to become AI-first?

To overcome the challenges that limit organization-wide deployment of AI technologies, banks must take a holistic approach. To become AI-first, banks must invest in transforming capabilities across all four layers of the integrated capability stack (Exhibit 6): the engagement layer, the AI-powered decisioning layer, the core technology and data layer, and the operating model.

As we will explain, when these interdependent layers work in unison, they enable a bank to provide customers with distinctive omnichannel experiences, support at-scale personalization, and drive the rapid innovation cycles critical to remaining competitive in today's world. Each layer has a unique role to play—under-investment in a single layer creates a weak link that can cripple the entire enterprise.

The following paragraphs explore some of the changes banks will need to undertake in each layer of this capability stack.

Layer 1: Reimagining the customer engagement layer

Increasingly, customers expect their bank to be present in their end-use journeys, know their context and needs no matter where they interact with the bank, and to enable a frictionless experience. Numerous banking activities (e.g., payments, certain types of lending) are becoming invisible, as journeys often begin and end on interfaces beyond the bank's proprietary platforms. For the bank to be ubiquitous in customers' lives, solving latent and emerging needs while delivering intuitive omnichannel experiences, banks will need to reimagine how they engage with customers and undertake several key shifts.

First, banks will need to move beyond highly standardized products to create integrated propositions that target “jobs to be done.”⁸ This requires embedding personalization decisions (what to offer, when to offer, which channel to offer) in the core customer journeys and designing value propositions that go beyond the core banking product and include intelligence that automates decisions and activities on behalf of the customer. Further, banks should strive to integrate relevant non-banking products and services that, together with the core banking product, comprehensively address the customer end need. An illustration of the “jobs-to-be-done” approach can be seen in the way fintech Tally helps customers grapple with the challenge of managing multiple credit cards. The fintech's customers can solve several pain points—including decisions about which card to pay first (tailored to the forecast of their monthly income and expenses), when to pay, and how much to pay (minimum balance versus retiring principal)—a complex set of tasks that are often not done well by customers themselves.

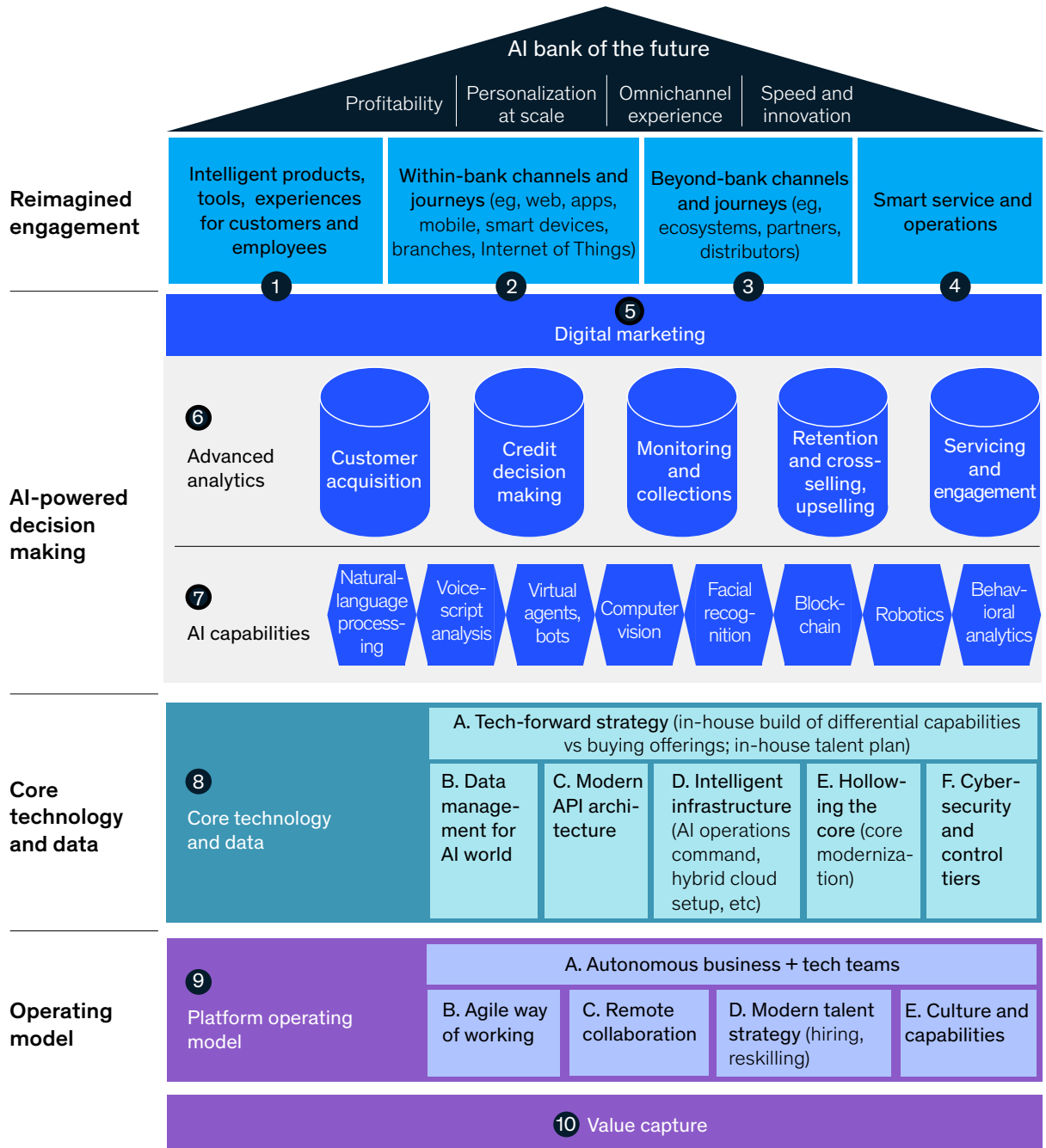
The second necessary shift is to embed customer journeys seamlessly in partner ecosystems and platforms, so that banks engage customers at the point of end use and in the process take advantage of partners' data and channel platform to increase higher engagement and usage. ICICI Bank in India embedded basic banking services on WhatsApp (a popular messaging platform in India) and scaled up to one million users within three months of launch.⁹ In a world where consumers and businesses rely increasingly on digital ecosystems, banks should decide on the posture they would like to adopt across multiple ecosystems—that is, to build, orchestrate, or partner—and adapt the capabilities of their engagement layer accordingly.

⁸ Clayton M. Christensen, Taddy Hall, Karen Dillon and David S. Duncan, “Know your customers ‘jobs to be done,’” *Harvard Business Review*, September 2016, hbr.org.

⁹ “ICICI Bank crosses 1 million users on WhatsApp platform,” *Live Mint*, July 7, 2020, livemint.com.

Exhibit 6

To become an AI-first institution, a bank must streamline its capability stack for value creation.



Third, banks will need to redesign overall customer experiences and specific journeys for omnichannel interaction. This involves allowing customers to move across multiple modes (e.g., web, mobile app, branch, call center, smart devices) seamlessly within a single journey and retaining and continuously updating the latest context of interaction. Leading consumer internet companies with offline-to-online business models have reshaped customer expectations on this dimension. Some banks are pushing ahead in the design of omnichannel journeys, but most will need to catch up.

Reimagining the engagement layer of the AI bank will require a clear strategy on how to engage customers through channels owned by non-bank partners. Banks will need to adopt a design-thinking lens as they build experiences within and beyond the bank's platform, engineering engagement interfaces for flexibility to enable tailoring and personalization for customers, reengineering back-end processes, and ensuring that data-capture funnels (e.g., clickstream) are granularly embedded in the bank's engagement layer. All of this aims to provide a granular understanding of journeys and enable continuous improvement.¹⁰

Layer 2: Building the AI-powered decision-making layer

Delivering personalized messages and decisions to millions of users and thousands of employees, in (near) real time across the full spectrum of engagement channels, will require the bank to develop an at-scale AI-powered decision-making layer. Across domains within the bank, AI techniques can either fully replace or augment human judgment to produce significantly better outcomes (e.g., higher accuracy and speed), enhanced experience for customers (e.g., more personalized interaction and offerings), actionable insights for employees (e.g., which customer to contact first with next-best-action recommendations),

and stronger risk management (e.g., earlier detection of likelihood of default and fraudulent activities).

To establish a robust AI-powered decision layer, banks will need to shift from attempting to develop specific use cases and point solutions to an enterprise-wide road map for deploying advanced-analytics (AA)/machine-learning (ML) models across entire business domains. As an illustration, in the domain of unsecured consumer lending alone, more than 20 decisions across the life cycle can be automated.¹¹ To enable at-scale development of decision models, banks need to make the development process repeatable and thus capable of delivering solutions effectively and on-time. In addition to strong collaboration between business teams and analytics talent, this requires robust tools for model development, efficient processes (e.g., for re-using code across projects), and diffusion of knowledge (e.g., repositories) across teams. Beyond the at-scale development of decision models across domains, the road map should also include plans to embed AI in business-as-usual process. Often underestimated, this effort requires rewiring the business processes in which these AA/AI models will be embedded; making AI decisioning "explainable" to end-users; and a change-management plan that addresses employee mindset shifts and skills gaps. To foster continuous improvement beyond the first deployment, banks also need to establish infrastructure (e.g., data measurement) and processes (e.g., periodic reviews of performance, risk management of AI models) for feedback loops to flourish.

Additionally, banks will need to augment homegrown AI models, with fast-evolving capabilities (e.g., natural-language processing, computer-vision techniques, AI agents and bots, augmented or virtual reality) in their core business processes. Many of these leading-edge capabilities have the

¹⁰ Jennifer Kilian, Hugo Sarrazin, and Hyo Yeon, "Building a design-driven culture," September 2015, McKinsey.com.

¹¹ Renny Thomas, Vinayak HV, Raphael Bick, and Shwaitang Singh, "Ten lessons for building a winning retail and small-business digital lending franchise," November 2019, McKinsey.com.

potential to bring a paradigm shift in customer experience and/or operational efficiency. While many banks may lack both the talent and the requisite investment appetite to develop these technologies themselves, they need at minimum to be able to procure and integrate these emerging capabilities from specialist providers at rapid speed through an architecture enabled by an application programming interface (API), promote continuous experimentation with these technologies in sandbox environments to test and refine applications and evaluate potential risks, and subsequently decide which technologies to deploy at scale.

To deliver these decisions and capabilities and to engage customers across the full life cycle, from acquisition to upsell and cross-sell to retention and win-back, banks will need to establish enterprise-wide digital marketing machinery. This machinery is critical for translating decisions and insights generated in the decision-making layer into a set of coordinated interventions delivered through the bank's engagement layer. This machinery has several critical elements, which include:

- Data-ingestion pipelines that capture a range of data from multiple sources both within the bank (e.g., clickstream data from apps) and beyond (e.g., third-party partnerships with telco providers)
- Data platforms that aggregate, develop, and maintain a 360-degree view of customers and enable AA/ML models to run and execute in near real time
- Campaign platforms that track past actions and coordinate forward-looking interventions across the range of channels in the engagement layer

Layer 3: Strengthening the core technology and data infrastructure

Deploying AI capabilities across the organization requires a scalable, resilient, and adaptable set of core-technology components. A weak core-

technology backbone, starved of the investments needed for modernization, can dramatically reduce the effectiveness of the decision-making and engagement layers.

The core-technology-and-data layer has six key elements (Exhibit 7):

- ***Tech-forward strategy.*** Banks should have a unified technology strategy that is tightly aligned to business strategy and outlines strategic choices on which elements, skill sets, and talent the bank will keep in-house and those it will source through partnerships or vendor relationships. In addition, the tech strategy needs to articulate how each component of the target architecture will both support the bank's vision to be an AI-first institution and interact with each layer of the capability stack.
- ***Data management for the AI-enabled world.*** The bank's data management must ensure data liquidity—that is, the ability to access, ingest, and manipulate the data that serve as the foundation for all insights and decisions generated in the decision-making layer. Data liquidity increases with the removal of functional silos and allows multiple divisions to operate off the same data, with increased coordination. The data value chain begins with seamless sourcing of data from all relevant internal systems and external platforms. This includes ingesting data into a lake, cleaning and labeling the data required for diverse use cases (e.g., regulatory reporting, business intelligence at scale, AA/ML diagnostics), segregating incoming data (from both existing and prospective customers) to be made available for immediate analysis from data to be cleaned and labeled for future analysis. Furthermore, as banks design and build their centralized data-management infrastructure, they should develop additional controls and monitoring tools to ensure data security, privacy, and regulatory compliance—for example, timely and role-appropriate access across the organization for various use cases.

Exhibit 7

The core-technology-and-data layer accommodates increasing use of the cloud and reduction of legacy technology.

Capabilities	Our perspective
Tech-forward strategy	Build differentiating capabilities in-house by augmenting the internal skill base ; carefully weigh options to buy, build, or compose modular architecture through best-of-breed solutions
Data management for AI world	Upgrade data management and underlying architecture to support machine-learning use cases at scale by leveraging cloud, streaming data, and real-time analytics
Modern API ¹ architecture	Leverage modern cloud-native tooling to enable a scalable API platform supporting complex orchestrations while creating experience-enhancing integrations across the ecosystem
Intelligent infrastructure	Implement infrastructure as code across on-premises and cloud environments; increase platform resiliency by adopting AIOps to support deep diagnostics, auto-recoverability, and auto-scale
Hollowing the core	Distribute transaction processing across the enterprise stack; selectively identify components that can be externalized to drive broader reuse, standardization, and efficiency
Cybersecurity and control tiers	Implement robust cybersecurity in the hybrid infrastructure ; secure data and applications through zero-trust design principles and centralized command-and-control centers

¹Application programming interface.

- **Modern API architecture.** APIs are the connective tissue enabling controlled access to services, products, and data, both within the bank and beyond. Within the bank, APIs reduce the need for silos, increase reusability of technology assets, and promote flexibility in the technology architecture. Beyond the bank, APIs accelerate the ability to partner externally, unlock new business opportunities, and enhance customer experiences. While APIs can unlock significant value, it is critical to start by defining where they are to be used and establish centralized governance to support their development and curation.¹²
- **Intelligent infrastructure.** As companies in diverse industries increase the share of workload handled on public and private cloud infrastructure, there is ample evidence that cloud-based platforms allow for the higher scalability and resilience crucial to an AI-first strategy.¹³ Additionally, cloud-based infrastructure reduces costs for IT maintenance and enables self-serve models for development teams, which enable rapid innovation cycles by providing managed services (e.g., setting up new environments in minutes instead of days).

¹² Renny Thomas, Vinayak HV, Raphael Bick, and Shwaitang Singh, "Ten lessons for building a winning retail and small-business digital lending franchise," November 2019, McKinsey.com.

¹³ Arul Elumalai and Roger Roberts, "Unlocking business acceleration in a hybrid cloud world," August 2019, McKinsey.com.

Layer 4: Transitioning to the platform operating model

The AI-first bank of the future will need a new operating model for the organization, so it can achieve the requisite agility and speed and unleash value across the other layers. While most banks are transitioning their technology platforms and assets to become more modular and flexible, working teams within the bank continue to operate in functional silos under suboptimal collaboration models and often lack alignment of goals and priorities.

The platform operating model envisions cross-functional business-and-technology teams organized as a series of platforms within the bank. Each platform team controls their own assets (e.g., technology solutions, data, infrastructure), budgets, key performance indicators, and talent. In return, the team delivers a family of products or services either to end customers of the bank or to other platforms within the bank. In the target state, the bank could end up with three archetypes of platform teams. Business platforms are customer- or partner-facing teams dedicated to achieving business outcomes in areas such as consumer lending, corporate lending, and transaction banking. Enterprise platforms deliver specialized capabilities and/or shared services to establish standardization throughout the organization in areas such as collections, payment utilities, human resources, and finance. And enabling platforms enable the enterprise and business platforms to deliver cross-cutting technical functionalities such as cybersecurity and cloud architecture.

By integrating business and technology in jointly owned platforms run by cross-functional teams, banks can break up organizational silos, increasing agility and speed and improving the alignment of goals and priorities across the enterprise.

The journey to becoming an AI-first bank entails transforming capabilities across all four layers of the capability stack. Ignoring challenges or underinvesting in any layer will ripple through all, resulting in a sub-optimal stack that is incapable of delivering enterprise goals.

A practical way to get started is to evaluate how the bank's strategic goals (e.g., growth, profitability, customer engagement, innovation) can be materially enabled by the range of AI technologies—and dovetailing AI goals with the strategic goals of the bank. Once this alignment is in place, bank leaders should conduct a comprehensive diagnostic of the bank's starting position across the four layers, to identify areas that need key shifts, additional investments and new talent. They can then translate these insights into a transformation roadmap that spans business, technology, and analytics teams.

Equally important is the design of an execution approach that is tailored to the organization. To ensure sustainability of change, we recommend a two-track approach that balances short-term projects that deliver business value every quarter with an iterative build of long-term institutional capabilities. Furthermore, depending on their market position, size, and aspirations, banks need not build all capabilities themselves. They might elect to keep differentiating core capabilities in-house and acquire non-differentiating capabilities from technology vendors and partners, including AI specialists.

For many banks, ensuring adoption of AI technologies across the enterprise is no longer a choice, but a strategic imperative. Envisioning and building the bank's capabilities holistically across the four layers will be critical to success.

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Global Banking & Securities

Reimagining customer engagement for the AI bank of the future

Banks can meet rising customer expectations by applying AI to offer intelligent propositions and smart servicing that can seamlessly embed in partner ecosystems.

by Violet Chung, Malcolm Gomes, Sailee Rane, Shwaitang Singh, and Renny Thomas



From instantaneous translation to conversational interfaces, artificial-intelligence (AI) technologies are making ever more evident impacts on our lives. This is particularly true in the financial-services sector, where challengers are already launching disruptive AI-powered innovations. To remain competitive, incumbent banks must become “AI first” in vision and execution, and as discussed in the previous article, this means transforming the full capability stack, including the engagement layer, AI-powered decision making, core technology and data infrastructure, and operating model. If fully integrated, these capabilities can strengthen engagement significantly, supporting customers’ financial activities across diverse online and physical contexts with intelligent, highly personalized solutions delivered through an interface that is intuitive, seamless, and fast. These are the baseline expectations for an AI bank.

In this article, we examine how banks can take an AI-first approach to reimagining customer engagement. We focus on three elements with potential to give the bank a decisive competitive edge:

1. The value of re-imagined customer engagement: By reimagining customer engagement, banks can unlock new value through better efficiency, expanded market access, and greater customer lifetime value.

2. Key elements of the re-imagined engagement layer: The combination of intelligent propositions, seamless embedding within partner ecosystems, and smart servicing and experiences underpins an overall experience that sets the AI bank apart from traditional incumbents.

3. Integrated supporting capabilities: As banks rethink and rebuild their engagement capabilities, they need to leverage critical enablers, each of which cuts across all four layers of the capability stack.

The value of reimagined customer engagement

In recent years, many financial institutions have devoted significant capital to digital-and-analytics transformations, aiming to improve customer journeys across mobile and web channels. Despite these big investments, most banks still lag well behind consumer-tech companies in their efforts to engage customers with superior service and experiences. The prevailing models for bank customer acquisition and service delivery are beset by missed cues: incumbents often fail to recognize and decipher the signals customers leave behind in their digital journeys.

Across sectors, however, leaders in delivering positive experiences are not just making their journeys easy to access and use but also personalizing core journeys to match an individual’s present context, direction of movement, and aspiration.

Creating a superior experience can generate significant value. A McKinsey survey of US retail banking customers found that at the banks with the highest degree of reported customer satisfaction, deposits grew 84 percent faster than at the banks with the lowest satisfaction ratings (Exhibit 1).

Superior experiences are not only a proven foundation for growth but also a crucial means of countering threats from new attackers. In particular, three trends make it imperative for banks to improve customer engagement:

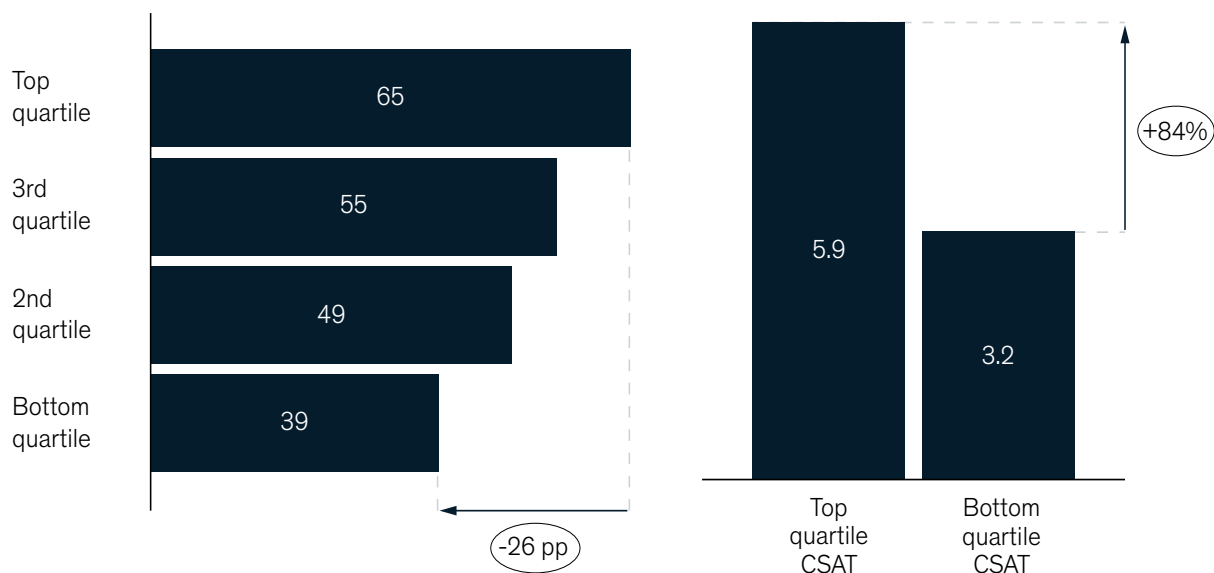
1. Rising customer expectations. Accustomed to the service standards set by consumer internet companies, today’s customers have come to expect the same degree of consistency, convenience, and personalization from their financial-services institutions. For example, Netflix has been able to raise the bar in customer experience by doing well on three crucial attributes: consistency of

Exhibit 1

US retail banks with high customer satisfaction typically grow deposits faster.

Real differences in customer satisfaction¹
CSAT² (Percent of customers rating 9 or 10)

Leaders in customer satisfaction grow faster
Deposit CAGR (2014-17)



¹Percentage of respondents that selected a 9 or 10 on a 10-point customer satisfaction scale. Question: "We would like to understand your experience with [product] with (Bank). Overall, how satisfied or dissatisfied are you with [product] with [Bank]?" Banks were ranked based on average satisfaction scores and then divided into quartiles.

²Customer satisfaction score.

Source: McKinsey 2018 Retail Banking Customer Experience Benchmark Survey

experience across channels (mobile app, laptop, TV), convenient access to a vast reserve of content with a single click, and recommendations finely tailored to each profile within a single account. Improving websites and online portals for a seamless experience is one of the top three areas where customers desire support from banks.¹ Innovation leaders are already executing transactions and loan approvals and resolving service inquiries in near real time.

2. Disintermediation. Nonbank providers are disintermediating banks from the most valuable services, leaving less profitable links in the value chain to traditional banks. Big-tech companies are

providing access to financial products within their nonbanking ecosystems. Messaging app WeChat allows users in China to make a payment within the chat window. Google has partnered with eight US banks to offer cobranded accounts that will be mobile first and focus on creating an intuitive user experience and new ways to manage money with financial insights and budgeting tools.²

Beyond access, nonbank innovators are also disintermediating parts of the value chain that were once considered core capabilities of financial institutions, including underwriting. Indian agtech company Cropin uses advanced analytics and machine learning to analyze historical data on

¹John Euart, Nuno Ferreira, Jonathan Gordon, Ajay Gupta, Atakan Hilal, and Olivia White, "Financial life during the COVID-19 pandemic—an update," July 2020, McKinsey.com.

²"Google to offer co-branded cards with 8 US banks" August 3, 2020, Finextra.com.

crop performance, weather patterns, land usage, and more to develop underwriting models that predict a customer's creditworthiness much more accurately than traditional risk models.

3. Increasingly human-like formats.

Conversational interfaces are becoming the new standard for customer engagement. With approximately one third of adult Americans owning a smart speaker,³ voice commands are gaining traction, and adoption of both voice and video interfaces will likely expand as in-person interactions continue to decline. Several banks have already launched voice-activated assistants, including Bank of America with Erica and ICICI bank in India with iPal.

If reimagined customer engagement is properly aligned with the other layers of the AI-and-analytics capability stack, it can strengthen a bank's competitive position and financial performance by increasing efficiency, access and scale, and customer lifetime value (Exhibit 2).

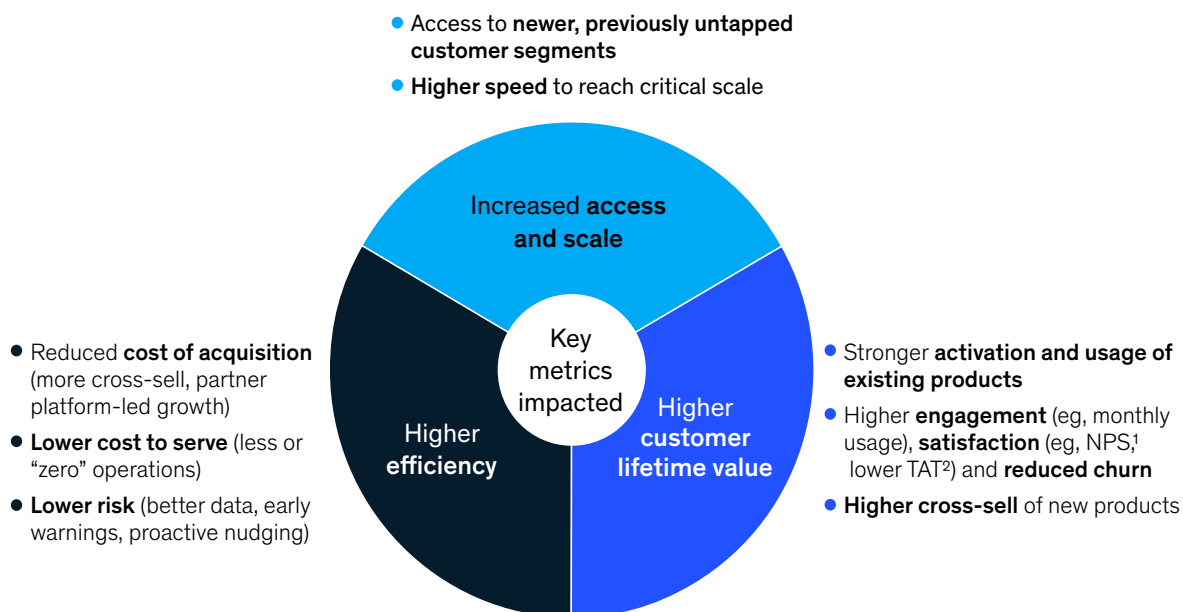
Key elements of the AI-first engagement layer

For banks, successfully integrating core personalization elements across the range of touchpoints with customers will be critical to deliver a superior experience and better outcomes. The reimagined engagement layer should provide the AI bank with a deeper and

³ Bret Kinsella, "Nearly 90 million U.S. adults have smart speakers, adoption now exceeds one-third of consumers," April 28, 2020, voicebot.ai.

Exhibit 2

With an AI-first approach to customer engagement, banks have the opportunity to reap gains in crucial areas.



¹Net promoter score.

²Turn around time.

Source: McKinsey analysis

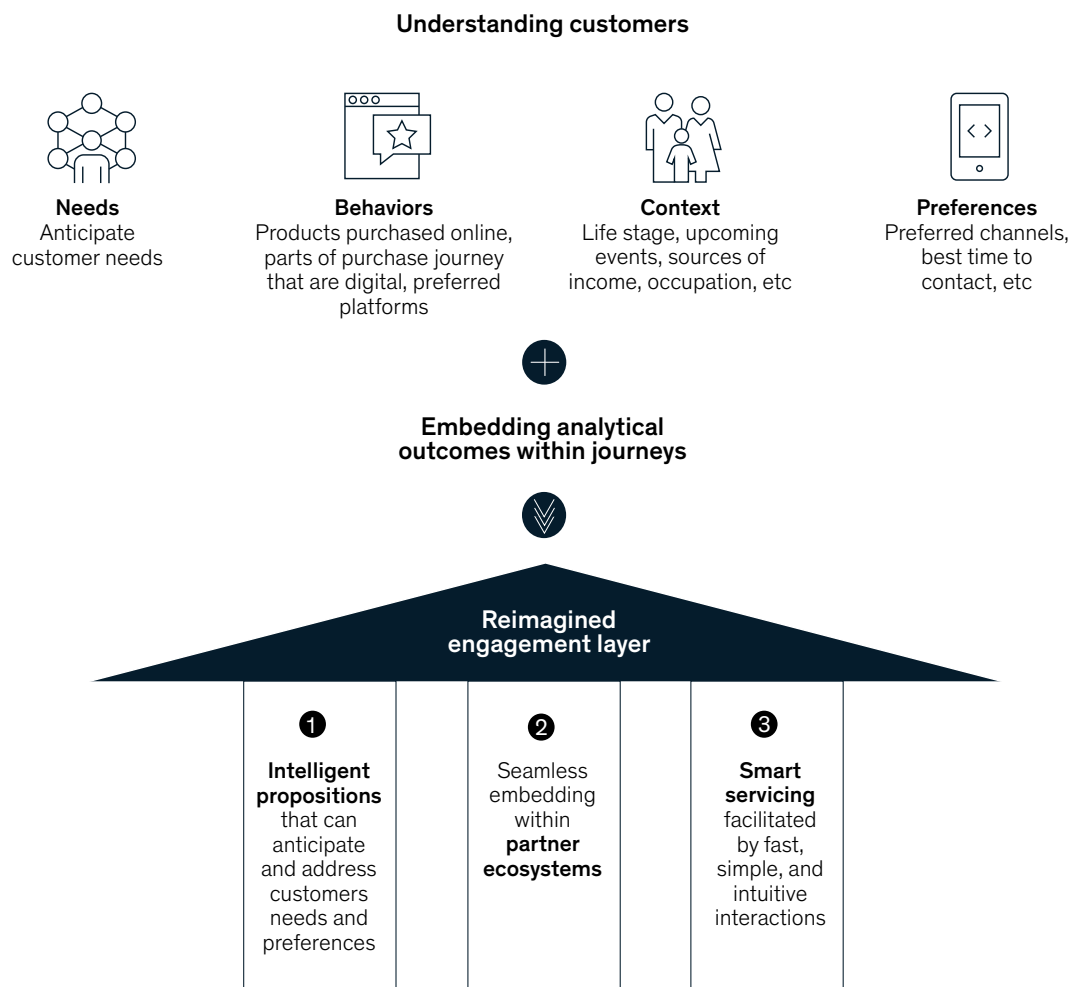
more accurate understanding of each customer's context, behavior, needs, and preferences. This understanding, in turn, enables the bank to craft an intelligent, personalized offering. To support this, banks need to analyze customer data in real time and embed analytical outcomes within customer journeys for fast execution of customer transaction requests and service queries, enabling instant fulfilment. These two objectives should guide the design of the engagement layer, which comprises three pillars: Intelligent propositions, seamless embedding within partner ecosystems, and smart service and experiences (Exhibit 3).

Intelligent propositions

To craft and deliver intelligent propositions, banks must take an entirely new approach to innovation. First and foremost, they need to free themselves from a product-centric view, where they develop new products and features and “push” them to customers through product bundles and discounted pricing. Instead, they should adopt a customer-centric view, which starts with understanding customer needs. Achieving this close alignment between bank capabilities and customer needs requires time and capital to develop a realistic, evidence-based understanding of actual customers’

Exhibit 3

A reimagined engagement layer uses AI and advanced analytics and comprises 3 key elements.



time-critical needs. The capability to gauge customers' expressed needs and anticipate latent needs in real time requires that AI and analytics capabilities be integrated with diverse core systems and delivery platforms across the enterprise.

Customer propositions can no longer be static and one-size-fits-all—they should be intelligent and tailored, and go beyond banking to address customer needs that may involve both banking and non-banking products and services.

Across diverse markets, recent innovations in messaging and financial-management tools are already helping customers simplify banking activities and improve their financial position—for example, with fee-reduction recommendations, budgeting tools, savings and liquidity management, and planning tools to help customers achieve their life goals.

- **Fee reduction recommendations.** Rapid analysis of transaction history enables banks to inform individual customers about their potential to reduce fees. The mobile app Empower highlights duplicate services and high bills and suggests possible actions, such as reducing the number of subscriptions or negotiating for more competitive mobile-phone fees, and recommends options for reducing bank fees. (E.g., “You can potentially reduce your telephone bill by 30 percent. We can negotiate with your service provider on your behalf and get you a better plan.”)
- **Budgeting tools.** Budgeting tools can help customers improve financial discipline. Acorns, for example, allows people to set budgets and sends them alerts to help them stay on track (“You have spent 75 percent of your dining limit this week”). It also delivers reminders based on past transactions (“You paid your credit card bill on the 10th last month. Would you like to pay now?”). Wally and Spendee automatically allocate expenses to different categories and show the proportion of monthly expense in a particular category (e.g., dining out or fuel) in comparison with the previous month's spending.
- **Planning for life goals.** Finally, by integrating systems across the enterprise, banks can analyze relevant data to generate a comprehensive view of a customer's total inflows and outflows and offer advice for balancing daily and annual spending with wealth-building goals. Wealthfront, a digital wealth-management tool, proposes an investment plan to customers based on their answers to a few questions. The process allows customers to define their goals in practical terms, such as learning how much to invest to buy a home in five years, take a year off to travel next year, or retire at 40. Chinese wealth-management fintech Snowball offers a cross-platform app with a Twitter-like feature that enables investors to exchange investment ideas.
- **Debt simplification:** Some fintech companies are helping customers who grapple with the challenge of managing multiple credit cards. For example, Fintech Tally helps solve a number of pain points, and decisions such as which card to pay first (based on a forecast of their monthly income and expenses), when to pay, and how much to pay (minimum balance vs. retiring principal), while optimizing their credit scores.

Embedding in partner ecosystems

As banks design and offer intelligent propositions they need to make them accessible not only on their own platforms but also in other ecosystems that their customers are part of. McKinsey research has identified 12 distinct ecosystems that have begun to form around end-to-end customer needs within distinct service domains. We estimate that these integrated networks will generate approximately \$60 trillion in global annual revenues by 2025.⁴

Just a few years ago, the most prominent examples were tech giants such as Alibaba, Baidu, and WeChat in China, and Amazon, Facebook, and Google in the United States. In the past two

⁴ Venkat Atluri, Miklós Dietz, and Nicolaus Henke, “Competing in a world of sectors without borders,” July, 2017, McKinsey.com.

years, however, both traditional companies and tech start-ups have contributed to significant expansion of ecosystem activity globally. Well-established banks have led the formation of digital ecosystems, often in one of five areas: B2C commerce, housing, B2B services, transportation, and wealth and protection. Examples include RBC's Ownr, a digital solution for entrepreneurs launching a business, and DBS's digital marketplace for automobiles, electricity, housing, and travel.

Ecosystem strategies. Financial institutions can leverage their own and/or partner ecosystems to create value in diverse ways, including increased access, higher efficiencies, and stronger offerings:

- **Increased access and scale.** By embedding their services within ecosystems, banks have the potential to access customer segments beyond their traditional footprint and to scale new solutions rapidly. For example, BBVA's Valora, a real estate and mortgage advisory platform, is an important channel for customer acquisition.
- **Higher efficiencies.** Participation in one or several ecosystems typically leads to lower customer acquisition costs, lower cost to serve, and better credit risk management. In China, for example, co-lending ecosystem partners rely on advanced diagnostic models to analyze ecosystem data to monitor potential changes in borrowers' risk profiles and to manage early-stage collection in case of default.
- **New value propositions.** Deniz Bank has launched Deniz Den, a platform for agricultural consulting and financial services, supporting farmers with timely information about agricultural best practices and advice on small-business finance and investments.
- **More convenience.** In India, SBI has launched YONO, designed as a one-stop solution to meet a broad range of a retail customers'

banking and nonbanking needs. It has more than 100 merchants embedded in the online marketplace, enabling customers to complete diverse tasks, such as ordering groceries and booking tickets, through a single app.

How to move forward. The gradual shift of commercial activity toward digital ecosystems has far-reaching implications for practically every sector of the economy, and each financial-services organization should build a detailed strategy for competing in these new contexts.⁵ At present, however, only a few banks have successfully tapped the potential of ecosystems to create value. To avoid common pitfalls and maximize the value of their ecosystem partnerships, banks need a clear ecosystem strategy, end-to-end integration of internal capabilities, and ways of working that are compatible with technology partners' methods.

Banks need a clear understanding of their strengths, local context, and current customers, which they should use to select an ecosystem strategy that fits the organization's ambition and market position. These are top priorities for the board and should not be left entirely to the chief digital officer.

End-to-end integration of internal capabilities is necessary to support real-time analytics and messaging. From the collection and processing of customer data to accurate customer-profile analysis, banks must upgrade their technology architecture and analytical capabilities. Further, as discussed in the following section, they should establish a consolidated, enterprise-wide platform for managing customer data. They should also establish robust links with partner ecosystems to support instantaneous data exchange.

Organizational culture and processes also matter. The bank should work in a way that matches the way technology partners work. This typically entails changes in organizational mindset and culture. One approach is to organize

⁵ Joydeep Sengupta, Vinayak HV, Violet Chung, et al., "The ecosystem playbook: Winning in a world of ecosystems," April 2019, McKinsey.com.

a team of top talent from multiple departments that speak the language of the tech partners, work at a compatible speed, and are empowered to make and implement decisions swiftly. Another key area is performance measurement. Traditionally, a bank's key performance indicators (KPIs) focus on growth and profitability. The core KPI for internet companies, by contrast, is user experience. If partners are not aligned in evaluating progress toward agreed-upon goals, tension can arise and diminish the impact of the collaboration.

Smart servicing and experiences

The third pillar of the reimagined engagement layer is smart servicing facilitated by fast, simple, and intuitive interactions with customers.

Banks that leverage AI and analytics to deliver smart servicing and superior experiences stand to increase customer satisfaction and loyalty. Research shows that the stronger the experience and the more satisfied the customer, the more likely it is that the bank will generate higher revenue: a more satisfied customer typically accounts for approximately 2.4 times more revenue than a neutral customer.⁶ What is more, we have seen that companies scoring high on a scale of customer satisfaction tend to generate higher total shareholder returns than lower-scoring companies do (Exhibit 4).

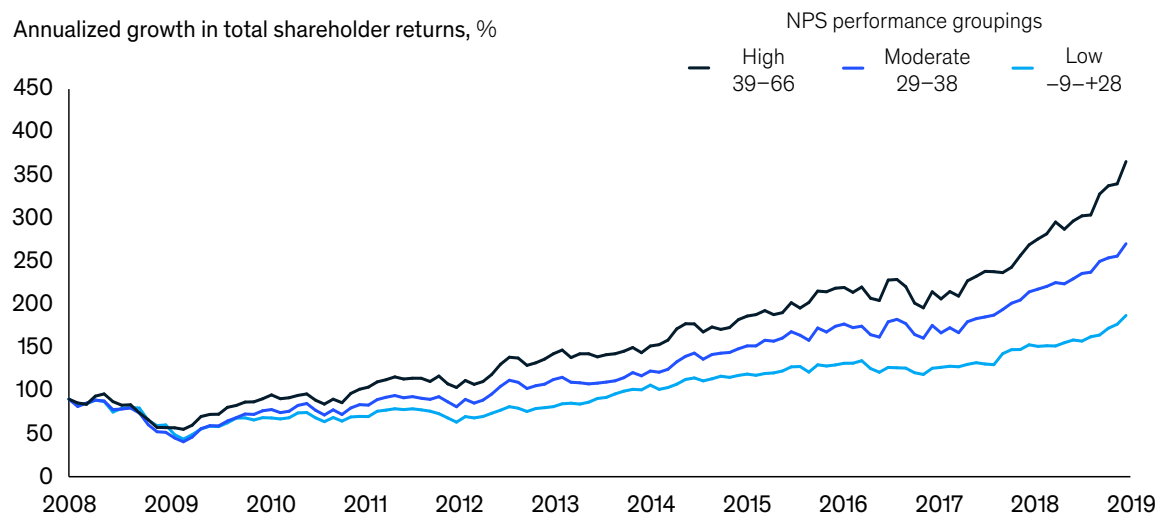
Along with the significant impact of customers' overall experience, customers' expectations also influence their level of satisfaction—and, by

⁶ Peter Kriss, "The Value of Customer Experience—Quantified," August 1, 2014, HBR.org.

Exhibit 4

Companies with higher customer satisfaction tend to generate higher returns.

Change in total returns to shareholders (TRS) for companies with high, moderate, and low net promoter scores (NPS)¹



¹To create this chart we gathered data on TRS for ~150 publicly traded companies. Using 2017 Temkin NPS data, we grouped the companies into low, moderate, and high NPS groups, and summarized the difference in annualized percent growth in total returns for each group from 2008–18. Source: McKinsey analysis; TRS data from DataStream 2008–2018; Temkin Group "October 2017 Net Promoter Score Benchmark Study"

extension, may affect the company's value. Given the rising trend in customers' expectations for online, offline, and hybrid journeys, disruptive companies in diverse markets are creating customer-centric interactions and journeys that are fast, simple, and intuitive. Guided by a relentless commitment to customer satisfaction, Amazon has achieved a high level of customer loyalty through value, convenience, and reliability in online shopping. Uber has set a high bar for speed, safety, and amicable service supported by frictionless end-to-end customer journeys. Netflix has created a highly differentiated experience by analyzing the viewing choices of hundreds of millions of subscribers to create highly personalized recommendations from its stock of diverse content.

The challenge for banks is to examine each crucial element in the design of differentiating customer experiences. First among these is the ability to open a service request on the device of choice anytime, anywhere. Second, each interaction should build on previous history and continue without interruption or repeated steps when the customer shifts from one device to another. The service interface should also be capable of recognizing the customer's context and adjust messaging accordingly. A third crucial element is speed: For example, a customer requesting a higher credit limit through a chatbot should receive a response within seconds, supported by real-time analysis of the customer's risk profile. If the request cannot be met at once, the time frame for fulfilling the request should be stated clearly.

Fourth, chatbots, voice assistants, and live video consultations make it possible to dispense with long, detailed forms and questionnaires. Insurance provider Lemonade offers a chat-based application form that follows a carefully designed conversation to generate an insurance quote. Likewise, self-serve journeys can offer prompt access to assistance through chatbots, with the ability to shift instantaneously and seamlessly to a live video chat with a service

representative or adviser as soon as the request exceeds machine capabilities.

Finally, it is crucial to personalize journeys in just the right way. For example, customers appreciate recommendations that they would not have thought of themselves. They often do not want more examples of what they have already bought. They need to be given the recommendations at the right time, when they are in "shopping mode." For example, sending a customer a reminder for repeating an order for flowers based on a purchase made on a special date last year, like an anniversary, may work very well. At the same time, organizations must be careful not to be "creepy" and offer instead recommendations that are highly relevant without crossing lines.⁷

Reimagined engagement requires integrated capabilities

To successfully design and implement their engagement layer to become AI-first, banks need to develop five capabilities:

1. Adopt a holistic, data-driven approach to understanding how customers engage with the bank. Best-in-class players achieve this in three major steps:

- **Implement a real-time, enterprise-wide data infrastructure** that captures virtually all data points for a given customer's relationship with the bank's various divisions and supports a unified customer view encompassing all channels, journeys, and products. (The traditional siloed analyses undertaken by any one of various teams have little relevance in an AI-first organization.)
- **Consolidate data on a central platform:** To ensure that these enterprise data sets are utilized effectively and widely across teams, AI-first banks aggregate the data captured from multiple internal and external sources into a central customer data platform.

⁷Julien Boudet, Brian Gregg, Jane Wong, and Gustavo Schuler, "What shoppers really want from personalized marketing," October 2017, McKinsey.com.

- ***Automate governance and controls*** to ensure business-and-technology teams have ready access to appropriate data sets, with the necessary controls for security and permission where needed. It is also important to ensure that the appropriate data are available for decisioning, at the right time and in the right form, to the various AA/ML models used by internal teams (from customer service to product management) to support intelligent, highly personalized interactions with customers.

2. Embed next-generation talent within traditional teams. Creating superior customer experiences in the digital era requires a new set of skills and capabilities centered on design, data science, and product management. An individual product manager, for example, may focus primarily on technical solutions, customer experiences, or maximizing business performance, but in an AI-first environment, all product managers will need a foundation in diverse areas, including customer experience, advanced analytics and machine learning, market analysis, business strategy, as well as leadership and capability development.⁸ Design leaders require a similar foundation as well as deep expertise in extracting user insights to guide business strategy and innovation.⁹ The data, analytics, and AI skills required to build an AI-bank are foreign to most traditional financial services institutions, and organizations should craft a detailed strategy for attracting them. This plan should define which capabilities can and should be developed in-house (to ensure competitive distinction) and which can be acquired through partnerships with technology specialists.

Furthermore, our experience suggests that it's not enough to staff the teams with new talent. What really differentiates experience leaders is how they integrate new talent in traditional team structures and unlock the full potential of these capabilities, in the context of business problems. Several organizations have built an

internal talent pool of data scientists and engineers. However, most treat data as an operational function and leverage data-and-analytics talent primarily to generate and automate reports required by traditional business teams. A few leaders treat data management as a strategic function, and embed data scientists/engineers within agile product and customer service teams, each focused on a discrete journey or use case, such as small business lending, home financing, or digital wealth advisory for the mass affluent. These organizations have been recognized as leaders in creating superior experiences that give them a competitive edge, measured in customer satisfaction and value creation.

3. Institute formal top-down mechanisms to support coordination across traditional product and channel silos. While financial services institutions take various measures to align working teams with groups focused on serving a specific customer segment, these measures typically take a long time to yield results (and often fail). The product and channel silos through which banks have traditionally sought to address the needs of diverse market segments can be very complex, and this complexity makes it difficult to break out of the product-centric mindset and assume a genuinely customer-centric view throughout the organization.

In our experience, bottom-up efforts to organize teams around customer segments often fall short of expectations if they are not complemented by a top-down approach consisting of cross-department senior management teams. While these teams are empowered to act (that is, they have resources and budgets, along with autonomy in deciding how to deploy these to meet strategic goals), they also take an integrated view of various siloed efforts across the organization and prioritize a limited number of high-impact cross-cutting initiatives that require central coordination (as opposed to spreading the organization's resources thin on several smaller initiatives). Finally, they develop and track progress against a coordinated plan executed through the traditional team structure.

⁸ Chandra Gnanasambandam, Martin Harrysson, Shivam Srivastava, and Yu Wu, "Product managers for the digital world," May 2017, McKinsey.com.
⁹ Melissa Dalrymple, Sam Pickover, and Benedict Sheppard, "Are you asking enough from your design leaders," February 2020, McKinsey.com.

4. Institutionalized capabilities to strike new partnerships at-scale with a heterogeneous set of non-financial services institutions. Partnerships are becoming increasingly critical for financial services players to extend their boundaries beyond traditional channels, acquire more customers, and create deeper engagement. Most institutions understand the importance of having a clear strategic rationale (including a “win-win” value creation thesis for partners), and a strong governance model to oversee the partnership. It is also important to establish teams responsible both for setting up partnerships and for adapting the technology infrastructure to support the efficient and speedy launch of the partnership.

- **Setting-up dedicated teams that are focused on establishing partnerships.** These teams constantly scan the market for potential partners and assess their relevance to the institution’s growth strategy. They engage effectively with a broad range of non-bank partners—beginning with a review of differences in culture and technology—and gauge the flexibility required to align with the partners’ ways of working (e.g., profile and seniority of people participating in discussions, decision-making styles, responsiveness to requests, adherence to timelines) to enable faster, smoother, and more productive collaboration.
- **Making the technology infrastructure partnership-friendly** hinges to a significant degree on API contracts identifying the functionalities that must be developed to meet the partner’s requirements. Another crucial step is altering the technology infrastructure to facilitate fast integration with partner capabilities. This includes creating sand-box environments to enable rapid experimentation

and proof-of-concept trials, as well as modern data-sharing and storage options compatible with the partner’s data-stack.

5. Deep integration with the remaining layers of the AI bank—that is, the AI-enabled decisioning layer and the core-tech and data layer. The journey to become an AI bank entails transforming capabilities across all four layers of the capability stack: engagement, AI-powered decisioning, core technology and data infrastructure, and operating model. The layers should work in unison, and investment in each layer should be made in tandem with the others. Underinvesting in any layer will create a ripple effect that hinders the ability of the stack as a whole to deliver enterprise goals.

As traditional banks observe the rapid advancement of AI technologies and the success of digital innovators in creating compelling customer experiences, many recognize the need to reimagine how they engage their customers. By adopting an AI-first approach in their vision and planning, innovative banks are building the capabilities that will enable them not just to deliver intelligent services but also to design intuitive, highly personalized journeys spanning diverse ecosystems, from banking to housing to retail commerce, B2B services, and more. To realize this vision requires new talent, a robust mechanism for managing partnerships, and a progressive transformation of the capability stack. Throughout this expansive undertaking, leaders must stay attuned to customer perspectives and be clear about how the AI bank will create value for each customer.

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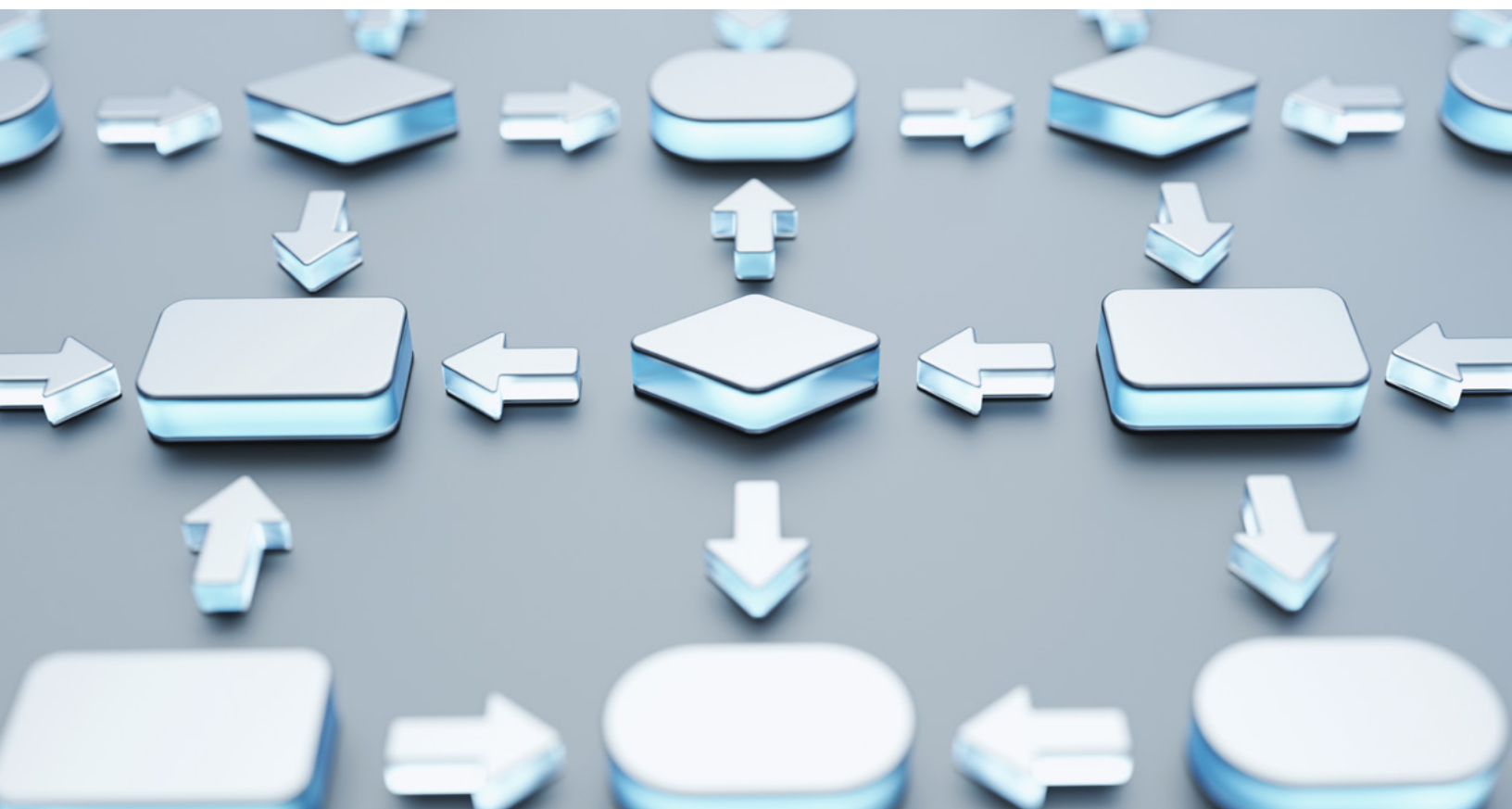
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Global Banking & Securities

AI-powered decision making for the bank of the future

Banks are already strengthening customer relationships and lowering costs by using artificial intelligence to guide customer engagement. Success requires that capability stacks include the right decisioning elements.

by Akshat Agarwal, Charu Singhal, and Renny Thomas



© Getty Images

The ongoing transition to digital channels creates an opportunity for banks to serve more customers, expand market share, and increase revenue at lower cost. Crucially, banks that pursue this opportunity also can access the bigger, richer data sets required to fuel advanced-analytics (AA) and machine-learning (ML) decision engines. Deployed at scale, these decision-making capabilities powered by artificial intelligence (AI) can give the bank a decisive competitive edge by generating significant incremental value for customers, partners, and the bank. Banks that aim to compete in global and regional markets increasingly influenced by digital ecosystems will need a well-rounded AI-and-analytics capability stack comprising four main layers: reimagined engagement, AI-powered decision making, core technology and data infrastructure, and leading-edge operating model.

The layers of the AI-bank capability stack are interdependent and must work in unison to deliver value, as discussed in the first article. In our second article, we examined how AI-first banks are reimagining customer engagement to provide superior experiences across diverse bank platforms and partner ecosystems. Here, we focus on the AA/ML decisioning capabilities required to understand and respond to customers' fast-evolving needs with precision, speed, and efficiency. Banks that leverage machine-learning models to determine in (near) real time the best way to engage with each customer have potential to increase value in four ways:

- *Stronger customer acquisition.* Banks gain an edge by creating superior customer experiences with end-to-end automation and using advanced analytics to craft highly personalized messages at each step of the customer-acquisition journey.
- *Higher customer lifetime value.* Banks can increase the lifetime value of customers by engaging with them continuously and intelligently to strengthen each relationship across diverse products and services.
- *Lower operating costs.* Banks can lower costs by automating as fully as possible document processing, review, and decision making, particularly in acquisition and servicing.
- *Lower credit risk.* To lower credit risks, banks can adopt more sophisticated screening of prospective customers and early detection of behaviors that signal higher risk of default and fraud.

As banks think about how to design and build a highly flexible and fully automated decisioning layer of the AI-bank capability stack, they can benefit from organizing their efforts around four interdependent elements: (1) leveraging AA/ML models for automated, personalized decisions across the customer life cycle; (2) building and deploying AA/ML models at scale; (3) augmenting AA/ML models with what we call “edge” capabilities¹ to reduce costs, streamline customer journeys, and enhance the overall experience; and (4) building an enterprise-wide digital-marketing engine to translate insights generated in the decision-making layer into a set of coordinated messages delivered through the bank's engagement layer.

Automated, personalized decisions across the customer life cycle

If financial institutions begin by prioritizing the use cases where AA/ML models can add the most value, they can automate more than 20 decisions in diverse customer journeys. Within the lending life cycle, for example, leading banks are relying increasingly on AI and analytics capabilities to add value in five main areas: customer acquisition, credit decisioning, monitoring and collections, deepening relationships, and smart servicing (Exhibit 1, next page).

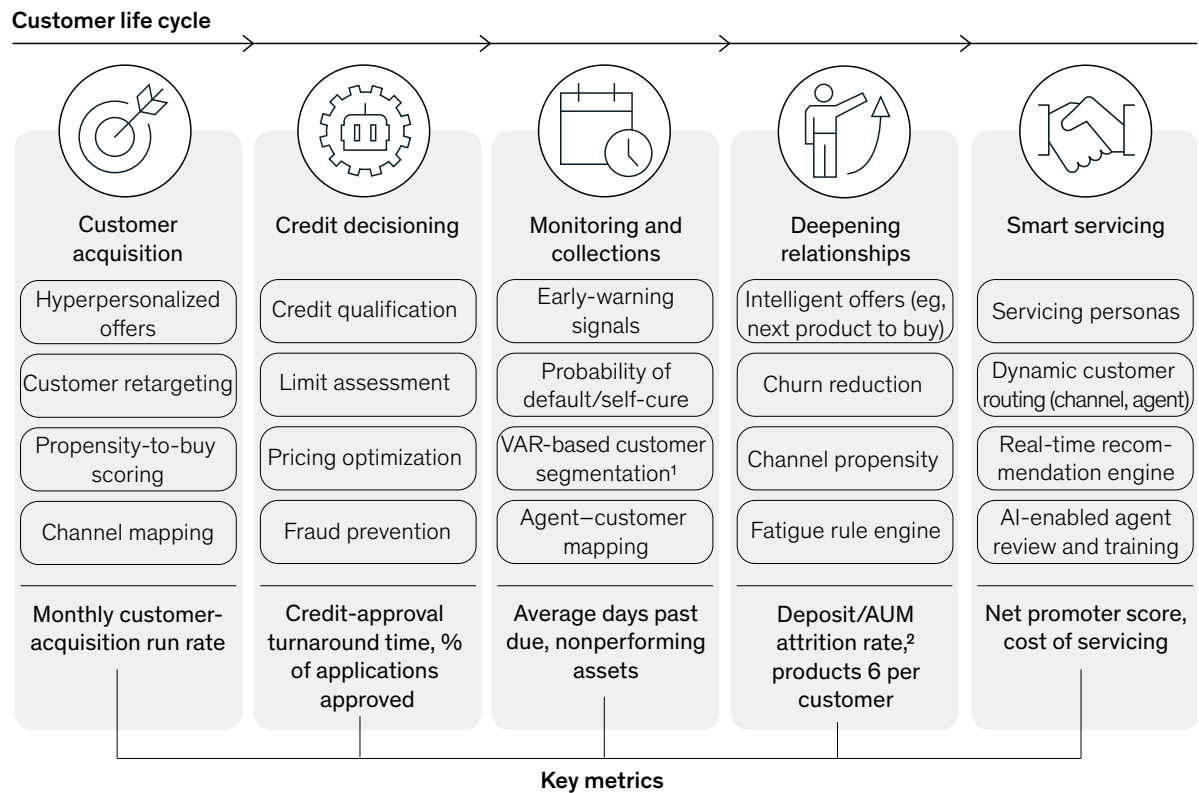
Customer acquisition

The use of advanced analytics is crucial to the design of journeys for new customers, who may follow a variety of paths to open a new card account,

¹Edge capabilities refer to next-generation AI-powered technologies that can provide financial institutions an edge over the competition. Natural language processing (NLP), voice-script analysis, virtual agents, computer vision, facial recognition, blockchain, robotics, and behavioral analytics are some of the technologies that we classify as “edge capabilities.” These capabilities can be instrumental in improving customer experience and loyalty across multiple dimensions (engagement channels, intelligent advisory, faster processing), personalizing offers with highly accurate underwriting, and improving operational efficiency across the value chain (from customer servicing to monitoring, record management, and more).

Exhibit 1

Banks should prioritize using advanced analytics (AA) and machine learning (ML) in decisions across the customer life cycle.



¹VAR is value at risk.

²AUM is assets under management.

apply for a mortgage, or research new investment opportunities. Some may head directly to the bank's website, mobile app, branch kiosk, or ATM. Others may arrive indirectly through a partner's website or by clicking on an ad. Many banks already use analytical tools to understand each new customer's path to the bank, so they get an accurate view of the customer's context and direction of movement, which enables them to deliver highly personalized offers directly on the landing page. Following local regulations governing the use and protection of customer data, banks can understand individuals' needs more precisely by analyzing how customers enter the website (search, keywords, advertisements), their browsing history (cookies, site history), and social-media data to form an initial profile of each customer, including financial position and provisional credit

scoring. Based on real-time analysis of a customer's digital footprint, banks can display a landing page tailored to their profile and preferences.

These tools can also help banks tailor follow-up messages and offers for each customer. Replacing much of the mass messaging that used to flow to thousands or tens of thousands of customers in a subsegment, advanced analytics can help prioritize customers for continued engagement. The bank can select customers according to their responsiveness to prior messaging—also known as their “propensity to buy”—and can identify the best channel for each type of message, according to the time of day. And for the “last mile” of the customer journey, AI-first institutions are using advanced analytics to generate intelligent, highly relevant messages

and provide smart servicing via assisted channels to create a superior experience, which has been shown to contribute to higher rates of conversion.²

Credit decisioning

Setting themselves apart from traditional banks, whose customers may wait anywhere from a day to a week for credit approval, AI-first banks have designed streamlined lending journeys, using extensive automation and near-real-time analysis of customer data to generate prompt credit decisions for retailers, small and medium-size enterprises (SMEs), and corporate clients. They do this by sifting through a variety of structured and unstructured data collected from conventional sources (such as bank transaction history, credit reports, and tax returns) and new ones (including location data, telecom usage data, utility bills, and more). Access to these nontraditional data sources depends on open banking and other data sharing guidelines as well the availability of officially approved APIs and data aggregators in the local market. Further, while accessing and leveraging personal data of customers, banks must secure data and protect customer privacy in accordance with local regulations (e.g., the General Data Protection Regulation in the EU and the California Consumer Privacy Act in the US).

By using powerful AA/ML models to analyze these broad and diverse data sets in near real time, banks can qualify new customers for credit services, determine loan limits and pricing, and reduce the risk of fraud.

- *Credit qualification.* Lenders seeking to determine if a customer qualifies for a particular type of loan have for many years used rule-based or logistic-regression models to analyze credit bureau reports. This approach, which relies on a narrow set of criteria, fails to serve a large segment of consumers and SMEs lacking a formal credit history, so these potential customers turn to nonbank sources of credit. In recent years, however, leading banks and fintech lenders have developed complex models for analyzing structured and unstructured data, examining hundreds of data points collected from social media, browsing history, telecommunications

usage data, and more. This decisioning process is automated from end to end, so it can be completed nearly instantaneously, enabling the bank to predict the likelihood of default for individuals in a vast and potentially profitable segment of unbanked and underbanked consumers and SMEs. As banks build and refine their qualification model, they can proceed gradually, testing and improving the model—for example, by using auto-approvals for customers up to a certain threshold with significantly lower default risk and using manual verification to review those estimated to have a higher default risk and then gradually shifting more cases to automated decisioning.

- *Limit assessment.* Leading banks are also using AA/ML models to automate the process for determining the maximum amount a customer may borrow. These loan-approval systems, by leveraging optical character recognition (OCR) to extract data from conventional data sources such as bank statements, tax returns, and utilities invoices, can quickly assess a customer's disposable income and capacity to make regular loan payments. The proliferation of digital interactions also provides vast and diverse data sets to fuel complex machine-learning models. By building data sets that draw upon both conventional and new sources of data, banks can generate a highly accurate prediction of a customer's capacity to pay. Just a few data sources that may be available for analysis (with the customer's permission) are emails, SMS, and e-commerce expenditures.
- *Pricing.* Banks generally have offered highly standardized rates on loans, with sales representatives and relationship managers having some discretion to adjust rates within certain thresholds. However, fierce competition on loan pricing, particularly for borrowers with a strong risk score, places banks using traditional approaches at a considerable disadvantage against AI-and-analytics leaders. Fortified with highly accurate machine-learning models for risk scoring and loan pricing, AI-first banks have been able to offer competitive rates while keeping their

²Erik Lindecrantz, Madeleine Tjon Pian Gi, and Stefano Zerbi, "Personalizing the customer experience: Driving differentiation in retail," April 2020, McKinsey.com.

risk costs low. Some are also using their decisioning capabilities to quantify the customer's propensity to buy according to the customer's use of different types of financial products. Some even leverage natural-language processing (NLP) to analyze unstructured transcripts of interactions with sales and service representatives and, in some cases, collections personnel. By basing the offered rate on both creditworthiness and propensity to buy, the bank can optimize the balance of total asset volume, risk, and interest income within a lending portfolio.

- *Fraud management.* As competition for credit relationships becomes concentrated in digital channels, the automated processing of loan applications and use of AA/ML models to expedite credit approval and disbursement of funds not only positions the bank to acquire new customers and increase market share, but also opens new opportunities for fraud. The costliest instances of fraud typically fall into one of five categories: identity theft, employee fraud, third-party or partner fraud

(e.g., fraud by sales agents), customer fraud, and payment fraud (including money laundering and sanctions violations). Banks should continuously update their fraud detection and prevention models, as we discuss later with regard to edge capabilities. Ping An, for example, uses an image-analytics model to recognize 54 involuntary micro-expressions that occur before the brain has a chance to control facial movements.³

AI-driven credit decisioning can build the business while lowering costs. Sharper identification of risky customers enables banks to increase approval rates without increasing credit risk. What is more, by automating as much of the lending journey as possible, banks can reduce the costs of support functions and strengthen each customer's experience with faster loan approval and disbursement of funds, fewer requests for documentation, and credit offers precisely tailored to meet customer needs. Exhibit 2 illustrates how AI-enabled decisioning capabilities underpin a customer's onboarding journey.

³ "Chinese banks start scanning borrowers' facial movements," Financial Times, October 28, 2018, ft.com.

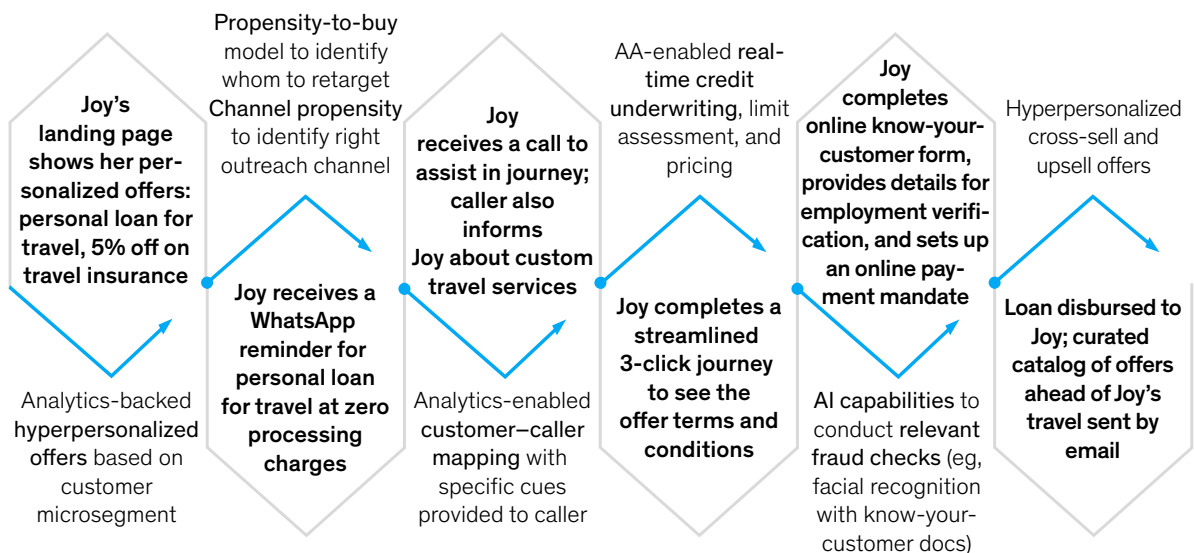
Exhibit 2

The combination of AI and analytics enhances the onboarding journey for each new customer.



Name: Joy
Age: 32 years
Occupation: Working professional

Family: Married, no children
Profile attribute: Avid traveler



Monitoring and collections

Once a bank has employed AA/ML models to automate loan underwriting and pricing, it can also deploy AI and advanced analytics to reduce the burden of nonperforming loans. Increasingly, banks are engaging with clients proactively to help them keep up with payments and work more closely with clients who encounter difficulties. By drawing upon internal and external data sources to build a 360-degree view of a customer's financial position, banks can recognize early-warning signals that a borrower's risk profile may have changed and that the risk of default should be reassessed.

Beyond conventional data sources like repayment data and credit bureau reports, banks can digitize and leverage other interaction data from campaigns, field visits, and collection agents' comments to draw insights for collections strategy. Further, a






variety of external data partnerships for location data and transaction history can help the bank understand both the customer's position and the most effective approach, or contact strategy, for averting default (Exhibit 3).

Contact strategy. To determine an appropriate contact strategy for customers at risk of default, banks can segment accounts according to value at risk (VAR), which is the loan balance times the probability of default. This allows banks to focus high-touch interactions on borrowers that account for the highest VAR; banks can then use low-cost channels like telephoning and texting for borrowers posing less risk. Banks have used this approach to reduce both the cost of collections and the volume of loans to be resolved through restructuring, sale, or write-off.⁴

⁴Ignacio Crespo and Arvind Govindarajan, "The analytics-enabled collections model," April 2018, McKinsey.com.

Exhibit 3

Advanced analytics and machine learning can classify customers into microsegments for targeted interventions.

Customer type					
					
	True low-risk	Absentminded	Dialer-based	True high-touch	Unable to cure
Targeted intervention	Use least experienced agents provided with set scripts	Ignore or use interactive voice message (segment will probably self-cure)	Match agents to customers; send live prompts to agents to modify scripts	Focus on customers able to pay and at high risk of not paying	Offer debt-restructuring settlements early for those truly underwater
Impact	Onscreen prompts guide agent–client conversation based on probability of breaking promises	10% of time saved, allowing for reassignment of agents to more difficult customers and specific campaigns	Matching and prompts can increase sense of connection and likelihood of paying	Added focus addresses higher probability of default rates in this segment	Significant increase in restructuring and settlements increases chance of collecting at least part of debt

Source: Ignacio Crespo and Arvind Govindarajan, "The analytics-enabled collections model," McKinsey on Payments, August 2018, McKinsey.com

Treatment strategy. If contact strategies through various channels are inadequate to help the customer resume timely payment, banks must pursue stronger measures, according to the customer's ability and willingness to pay. Customers with high willingness but limited ability to pay in the short term may require restructuring of the loan through partial-payment plans or loan extensions. In cases where the customer exhibits both low willingness and limited ability to pay, banks should focus on early settlement and asset recovery. Advanced analytics, enabled by unstructured internal data sources such as call transcripts from collections contact centers and external data sources such as spending behavior on other digital channels, can improve the accuracy of determinations of ability and willingness to pay.

Deepening relationships

Strong customer engagement is the foundation for maximizing customer value, and leaders are using advanced analytics to identify less engaged customers at risk of attrition and to craft messages for timely nudges. As with any customer communication in a smart omnichannel service environment, each personalized offer is delivered through the right channel according to the time of day. Rich internal data for existing customers can enable financial institutions to create a finely tuned outreach strategy for each individual customer, guided by risk considerations.

Deeper relationships are predicated on a bank's precise understanding of a customer's unique needs and expectations. A bank can craft offers to meet emerging needs and deliver them at the right time and through the right channel. By doing so, the bank demonstrates that it understands customers' current position and aspirations and can help them get from the former to the latter. For example, by analyzing browsing history and spending patterns, a bank might recognize a consumer's need for credit to finance an upcoming purchase of a household appliance. Analysis of internal data on product usage can also reveal areas where the bank can make its offering more relevant to a customer's current needs. Ping An, for example, has developed

a prediction algorithm to estimate the ideal product-per-customer (PPC) ratio for each user, based on individual needs. If analysis of a customer's needs produces an anticipated product usage ratio of eight but the customer uses only two products, the relationship manager receives a prompt to reach out to the customer and cross-sell or up-sell relevant ecosystem products.⁵

Servicing and engagement

AI-powered decisioning can enable banks to create a smart, highly personalized servicing experience based on customer microsegments, thereby enabling different channels to deliver superior service and a compelling experience with interactions that are fast, simple, and intuitive.⁶ Banks can support their relationship managers with timely customer insights and tailor-made offers for each customer. They can also significantly improve agents' productivity with streamlined preapproved products crafted to meet each customer's distinct needs. Models that analyze voice and speech characteristics can match agents with customers based on behavioral and psychological mapping. Similarly, transcript analysis can enable prediction of customer distress and suggest resolution to the agent.

Deployment of AA/ML models at scale

Leveraging AI to automate decision making in near real time is a complex and costly endeavor. If banks are to earn the required return on their technology investments, they must begin with a strategy and road map to capture maximal scale benefits in the design, building, and deployment of AA/ML models.

As banks embark on this journey, leaders must encourage all stakeholders to break out of siloed mindsets and think broadly about how models can be designed for uses in diverse contexts across the enterprise. AI-first organizations have succeeded by organizing the effort around four

⁵"Ping An Bank: Change everything," Asiamoney, September 26, 2019, asiamoney.com.

⁶Violet Chung, Malcolm Gomes, Sailee Rane, Shwaitang Singh, Renny Thomas, "Reimagining customer engagement for the AI bank of the future," McKinsey.com, October 2020.

main elements: First, they prioritize the analytics use cases with the biggest impact on customer experience and the most value for the bank. Second, they ensure that the data architecture, data pipelines, application programming interfaces (APIs), and other essential components are available for building and deploying models at scale through standardized, repeatable processes.⁷ Third, they establish a semiautonomous lab for experimentation and prototype development and set up a factory for industrial-scale production of the solution. Fourth, they assemble the right mix of talent for agile, cross-functional teams and empower them to maximize value in close alignment with enterprise strategy.

Several leading banks have established semi-autonomous labs offering a test-and-learn

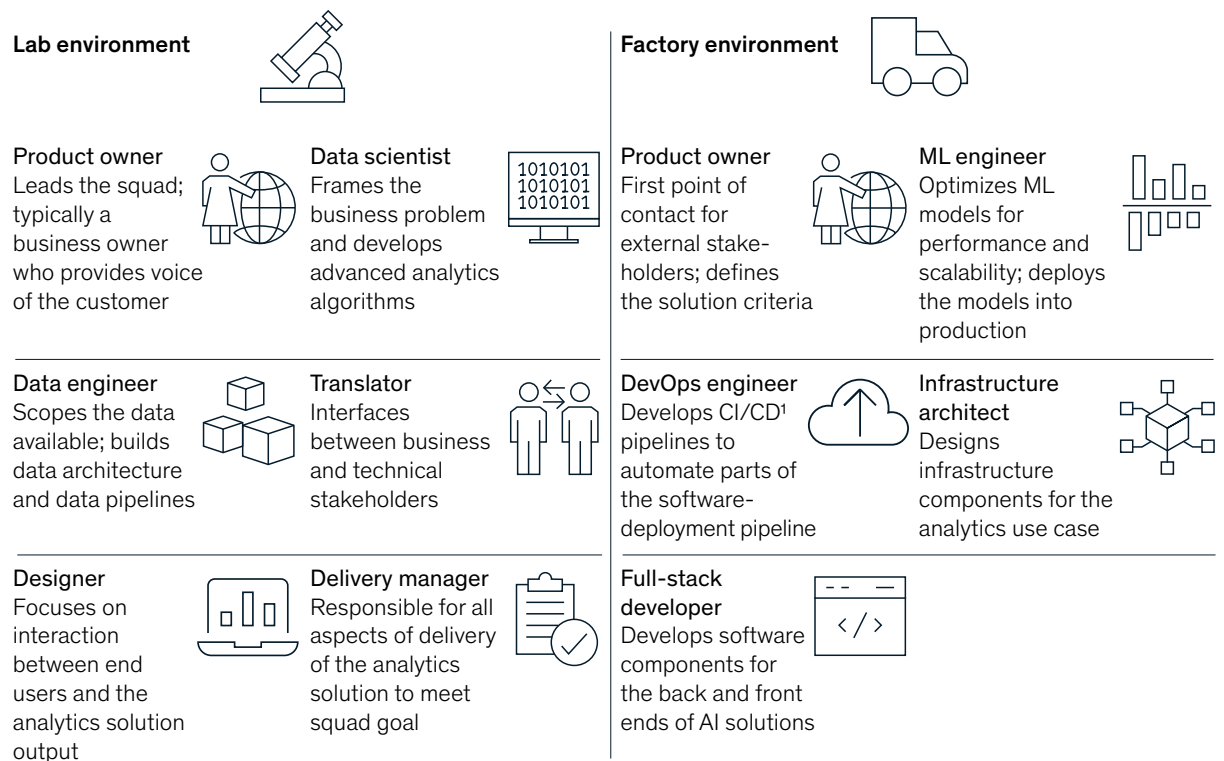
environment where cross-functional teams can experiment with different approaches to achieving the value-generating goals of a particular use case, moving from minimal viable product to scalable solution in a matter of weeks. Building AA/ML models at scale and deploying them across the enterprise depend on matching the right talent and skills with each of the roles required for a successful analytics lab and factory (Exhibit 4).⁸

The lab combines talent from business, analytics, technology, operations, and more. There are two main technical roles. One is the data scientist, who is responsible for identifying the analytics techniques required to meet the business goal and for programming advanced analytics algorithms. The other is the data engineer, who scopes the data

⁷Tara Balakrishnan, Michael Chui, Bryce Hall, and Nicolaus Henke, "The state of AI in 2020," November 2020, McKinsey.com.
⁸Nayur Khan, Brian McCarthy, and Adi Pradhan, "Executive's guide to developing AI at scale," October 2020, McKinsey.com.

Exhibit 4

Diverse roles are necessary for building and deploying AA/ML models at scale.



¹Continuous integration and continuous deployment.

available, identifies major sources of data to be consolidated for analytics, develops data pipelines to simplify and automate data movement, and sets up data architecture for storage and layering. In addition, the role of translator is crucial to ensure consistent communication and smooth collaboration between business leaders and analytics specialists.

On factory teams, one of the primary technical roles is the DevOps engineer, who is responsible for developing continuous integration (CI) and continuous deployment (CD) pipelines for deploying software. In addition, the full-stack developer is responsible for developing software components for other layers of the stack. The machine-learning engineer prepares models for deployment at scale, and the infrastructure architect ensures that the analytics solution is compatible with the architecture of the core tech and data layer of the capability stack.

The lab-and-factory setup requires flexible and scalable technologies to handle the changing requirements of analytics engines. It is also important to give analytics teams access to the centralized data lake, and these teams must be able to draw upon raw data from diverse sources to generate data sets to be used in building models. The technology supporting the solution must be modular to allow the transfer of developed solutions to factory production using DevOps tools. Finally, it is crucial to embed performance management and risk controls within models to avoid adverse impacts on operations.

Once the lab has developed a model, the factory takes over, running 24/7 to put the model into production and deploying it at scale in diverse use cases across the enterprise.

Augmented AA/ML models with edge capabilities

The rapid improvement of AI-powered technologies spurs competition on speed, cost, experience, and intelligent propositions. To maintain its market leadership, an AI-first institution must develop models capable of meeting the processing requirements of edge capabilities, including natural-language processing (NLP), computer vision, facial recognition, and more.

Some edge technologies already afford banks the opportunity to strengthen existing models with expanded data sets. For example, many interactions with customers—via telephone, mobile app, website, or increasingly, in a branch—begin with a conversational interface to establish the purpose of the interaction and collect the information required to resolve the query or transfer it to an agent. A routing engine can use voice and image analysis to understand a customer's current sentiment and match the customer with a suitable agent. The models underpinning virtual assistants and chatbots employ NLP and voice-script analysis to increase their predictive accuracy as they churn through vast unstructured data generated during customer-service and sales interactions.

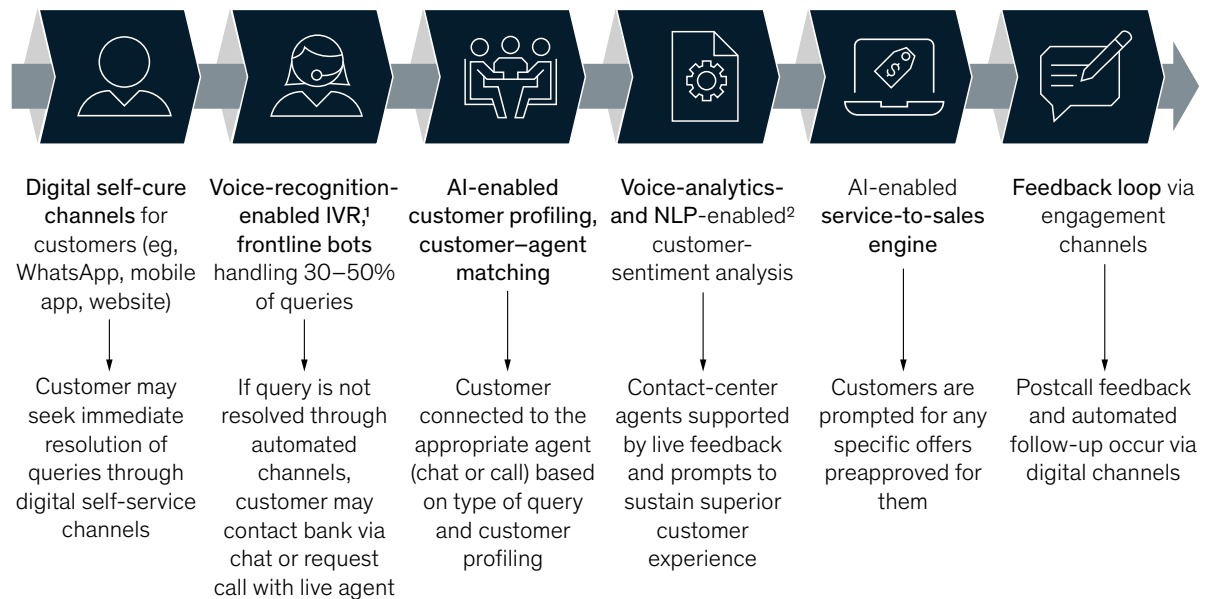
While each customer-service journey presents an opportunity to deepen the relationship with the help of next-product-to-buy recommendations, banks should constantly seek to improve their recommendation engines and messaging campaigns. Feedback loops, for example, can help marketing teams and frontline officers gauge the effectiveness of an offer by analyzing customers' ongoing browsing and transaction activity within the bank's digital ecosystem and beyond (Exhibit 5, next page).

As edge capabilities become more powerful, leaders are developing new, increasingly complex analytics solutions to create a superior experience and introduce distinctive innovations. Use of computer vision and voice-to-script conversion can speed the completion of forms—for instance, enabling a customer to respond orally to questions and upload documents from which relevant data can be extracted automatically using optical character recognition (OCR). Facial and sentiment analysis during an in-person consultation or videoconference can support frontline representatives with messages and offers finely tuned to the customer's needs and aspirations.

Several banks use voice recognition to verify customer identity for certain low-value, high-volume transactions. Some are using facial

Exhibit 5

Edge capabilities enhance customer-service journeys.



¹Interactive voice response.

²Natural-language-processing-enabled.

recognition to authenticate customers' identity as soon as they enter a branch, approach an ATM, or open the banking app on a mobile device. As noted earlier, facial analysis is also useful in identifying potential fraud.

Leading banks are using blockchain to create smart contracts, secure trade documents and automate the release of funds upon delivery of goods, and establish shared utilities to reduce the burden of know-your-customer (KYC) and anti-money-laundering (AML) compliance for banks and customers. Edge capabilities deployed as part of an enterprise strategy to enhance the AI bank's value proposition have the potential not only to improve credit underwriting and fraud prevention but also to reduce the costs of document handling and regulatory compliance.

Enterprise-wide digital marketing engine

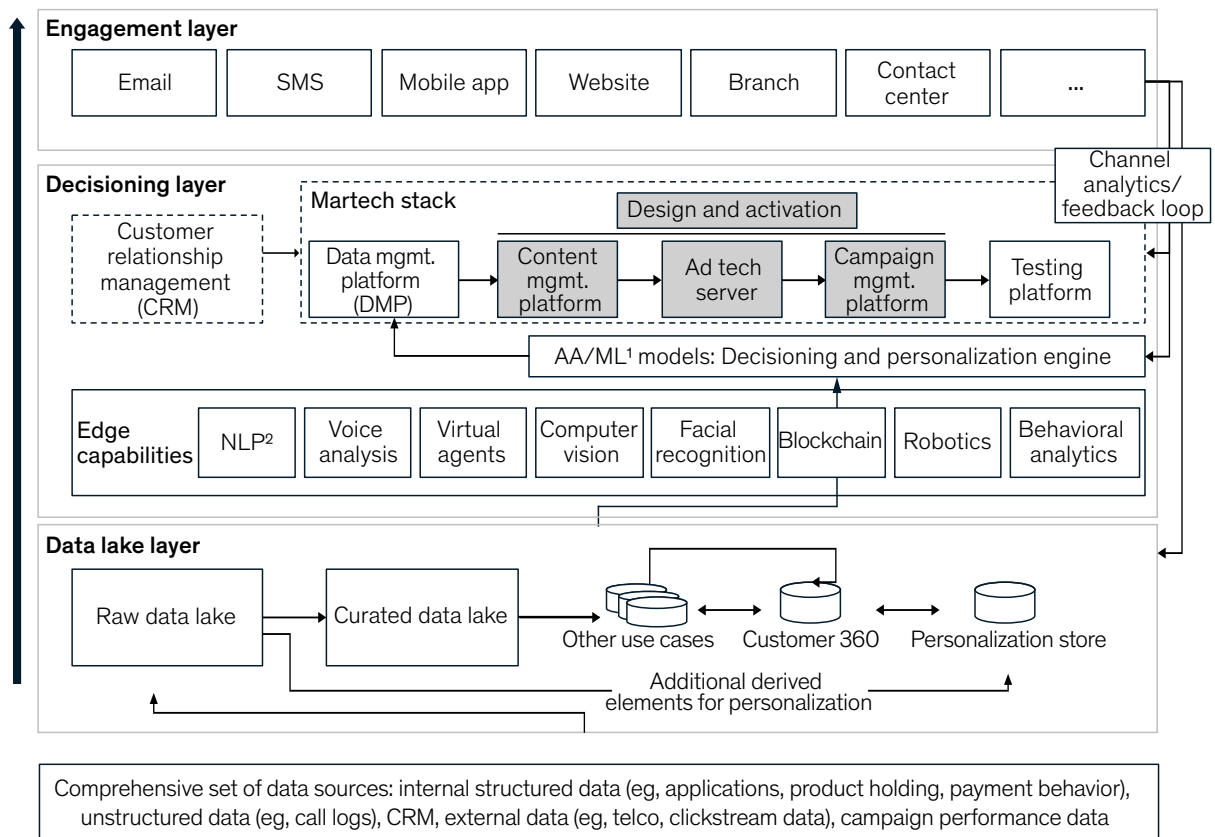
While the automated decisions generated by AA/ML models provide highly accurate, real-time predictions

of customer behaviors, banks must go the last mile to ensure that these analytical insights have an impact on customer behavior, such as purchasing a product, making a loan payment, or exploring new service offers. In other words, an organization must establish a mechanism to "translate" analytical outcomes into compelling messages to communicate to the customer at the right time, through the preferred channel—be it email, SMS, mobile app, website, branch staff, or a relationship manager—according to the time of day.

This last mile from decisioning to messaging is the domain of the digital marketing engine. Seamlessly integrated with applications across the full AI-and-analytics capability stack with the help of APIs, from data infrastructure to engagement channels, this engine supports the nearly instantaneous processing of raw data to produce tailored messages communicated via engagement channels. Exhibit 6, on the next page, illustrates the position of the digital

Exhibit 6

The digital marketing engine requires full stack capabilities.



¹Advanced-analytics and machine-learning.

²Natural-language processing.

marketing engine (or martech stack) within the decisioning layer of the AI-bank capability stack.

The digital marketing engine comprises platforms and applications fulfilling four main functions: data management, design and activation, measurement and testing, and channel analytics. The data management platform, which forms part of the core tech and data infrastructure layer of the AI-bank capability stack, supplies the data used to create and manage target customer segments. The design and activation function has three elements: (1) the content management platform, where messages, offers, advertisements, and

other interventions are created, managed, and modified; (2) the ad tech server, which automates advertisements based on data analysis; and (3) the campaign management platform, which supports the creation and management of marketing campaigns, which are conducted automatically according to the microsegmentation generated by the data management platform.

Just as the AI-and-analytics capability stack entails fundamental changes in the organization's talent, culture, and ways of working, the success of digital marketing

capabilities depends on an agile operating model. This model consists of autonomous cross-functional teams (or pods) drawing upon the talent of different parts of the enterprise, such as business units, marketing, analytics, channels, operations, and technology. Each pod should also include representatives from partner organizations crucial to the digital marketing effort—for example, user-interface and user-experience designers, who lay out the campaign's look and feel and its flow, and copywriters, who finalize the language of any intervention. The members of each pod collaborate on developing, managing, and improving engagement campaigns, and each member is accountable for campaigns' impact according to clearly defined key performance indicators (KPIs).

To achieve the desired outcome, an AI-first bank launching daily personalized communications to millions of customers must build tools for continual testing and learning. The measurement and testing platform flags potential aspects of content or distribution to improve, thereby enabling teams to evaluate in real time the effectiveness of campaigns.

Another source of continual feedback is channel analytics, which includes tools and dashboards for real-time tracking of engagement across each target segment. Every day, each pod leverages the channel analytics and measurement and testing platforms to closely track various indicators, including delivery rates, email open rates, click-through rates by channel for customers seeking more information (the first call to action), conversion rates, and more. These diagnostics help members of the pod experiment with potential enhancements to messages, advertisements, and campaign design.

As an example, Commonwealth Bank of Australia (CBA) leverages its mobile app to test messages and learn within hours what works and what must be changed. This cadence enables rapid scaling of campaigns to similar customer segments.⁹

In measurement of campaigns' impact, scientific rigor is crucial. To allow for precise measurement of the incremental value of the campaign, each target segment should include a control group of customers excluded from the campaign. The tools and capabilities for evaluating the effectiveness of customer-engagement campaigns help employees across the organization understand how they can enhance their impact on individual customers and add value to an AI-oriented culture.

The rapid improvement of AI-powered technologies spurs competition on speed, cost, experience, and intelligent propositions. To remain competitive, banks must engage customers with highly personalized and timely content to build loyalty. Personalized offers with tailored communication delivered at the right time through the customer's preferred channel can help banks maximize the lifetime value of each customer relationship and reinforce the organization's market leadership. To achieve these benefits, banks must build AI-powered decisioning capabilities fueled by a rich mixture of internal and external data and augmented by edge technologies. The core technology and data infrastructure required to collect and curate increasingly diverse and voluminous data sets is the topic of the next article in our series on the AI-bank capability stack.

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⁹Paul McIntyre, "CommBank's analytics chief on how its AI-powered 'Customer Engagement Engine' is changing everything," Mi3, September 21, 2020, mi-3.com.au.

Global Banking & Securities

Beyond digital transformations: Modernizing core technology for the AI bank of the future

For artificial intelligence to deliver value across the organization, banks need core technology that is scalable, resilient, and adaptable. Building that requires changes in six key areas.

by Sven Blumberg, Rich Isenberg, Dave Kerr, Milan Mitra, and Renny Thomas



An artificial-intelligence (AI) bank leapfrogs the competition by organizing talent, technology, and ways of working around an AI-first vision for empowering customers with intelligent value propositions delivered through compelling journeys and experiences. Making this vision a reality requires capabilities in four areas: an engagement layer, decisioning layer, core technology layer, and platform operating model.

We discussed the the first two areas in the previous articles. The capabilities of the reimagined engagement layer enable the AI bank to deliver highly personalized seamless journeys across bank channels and within partner ecosystems. The capabilities of the AI-powered decisioning layer transform customer insights into messages and offers tailored to address a customer's unique needs. The current article identifies capabilities needed in the third area, the core technology and data infrastructure of the modern capability stack.

Deploying AI capabilities across the organization requires a scalable, resilient, and adaptable set of core-technology components. When implemented successfully, this foundational layer can enable a bank to accelerate technology innovations, improve the quality and reliability of operations, reduce operating costs, and strengthen customer engagement.

We begin by summarizing the primary demands banking leaders should consider as they plan an enterprise-wide initiative to modernize core technology, data management, and the underlying infrastructure. Next, we examine the key transformations required to modernize the core technology and data infrastructure. We conclude by sharing 12 actions technology leaders should consider taking to ensure the transformation creates value for customers and the bank.

An AI-first model places demands on a bank's core technology

Across industries, many organizations have struggled to keep pace with the demand for digitization, especially as consumers accelerated their adoption of digital channels for daily transactions during the COVID-19 crisis.¹ Even before that, however, the financial-services industry has historically had mixed success in technology. Institutions that were early adopters and innovators in technology have built up a complex landscape of technical assets over decades and accumulated significant technical debt. Some institutions have tackled this challenge; many are behind the curve. Meanwhile, alongside the incumbents, an extremely active fintech industry has been constantly innovating and raising the bar.

Financial institutions that have shifted from being intensive consumers of technology to making AI and analytics a core capability are finding it easier to shift into the real-time and consumer-centric ecosystem. As AI technologies play an increasingly central role in creating value for banks and their customers, financial-services organizations need to reinvent themselves as technology-forward institutions, so they can deliver customized products and highly personalized services at scale in near real time.

At many institutions, standard practices now include omnichannel engagement, the use of APIs to support increased real-time information exchange across systems, and the use of big data analytics to improve credit underwriting, evaluate product usage, and prioritize opportunities for deepening relationships. As financial-services organizations continue to mature, the increasing demands on the technology infrastructure to support more complex use cases involving analytics and real-

¹Tamara Charm, Anne Grimmelt, Hyunjin Kim, Kelsey Robinson, Nancy Lu, Mayank, Mianne Ortega, Yvonne Staack, and Naomi Yamakawa, "Consumer sentiment and behavior continue to reflect the uncertainty of the COVID-19 crisis," October 2020, McKinsey.com.

time insights are pushing firms to reexamine their overall technology function. Once they have committed to modernizing the core technology and data infrastructure underpinning the engagement and decision-making layers of the capability stack, banks should organize their transformation around six crucial demands: technology strategy, superior experiences, scalable data and analytics platforms, scalable hybrid infrastructure, configurable product processors, and cybersecurity strategy (Exhibit 1).

Robust strategy for building technology capabilities

Before embarking on a fundamental transformation of core technology and data infrastructure, financial-services organizations should craft a detailed strategy for building an AI-first value proposition. They should also develop a road map for the transformation, focusing on three dimensions of value creation: faster time to market with efficient governance and productivity tracking, clear alignment of

demand and capacity to meet strategic and near-term priorities, and a well-defined mechanism to coordinate “change the bank” and “run the bank” initiatives according to their potential to generate value.

Faster time to market requires efficient and repeatable development and testing practices coupled with robust platforms and productivity-measurement tools. Aligning demand and capacity according to strategic priorities works on two levels. On one level, banks need to ensure that execution, infrastructure, and support capacity are optimized to ensure constant operation of all use cases and journeys. On the other, with constant uptime assured, work should be organized and scheduled to expedite projects having the greatest impact on value. Finally, financial institutions should establish clear mechanisms for setting priorities and ensuring that each use case is designed and built to generate a return exceeding capital investments and operating costs.

Exhibit 1

The AI-bank transformation places several crucial demands on core technology and data infrastructure.



Robust strategy for building technology capabilities



Superior omnichannel journeys and customer experiences



Modern, scalable platform for data and analytics



Scalable hybrid infrastructure strategy for the cloud



Highly configurable and scalable core product processors



Secure and robust perimeter for access

Superior omnichannel journeys and customer experiences

Building journeys that excite customers with their speed, intuitiveness, efficiency, and impact typically involves various applications spanning multiple bank and nonbank systems, all linked together by a series of APIs and integrations. This complex information exchange enables the organization to ingest valuable data from diverse sources to produce highly personalized messages and offers that speak directly to the customer in near real time. In addition to a standardized approach to managing APIs, banks should develop a clear mechanism to integrate across channels, core systems, and external interfaces while managing changes across multiple dependent systems. They should bear in mind, for example, that introducing a change in an existing digital channel could potentially entail changes not only across the front end but also across multiple interfacing systems, core product processors, and analytics layers.

A focus on journeys and user experience also benefits back-office and operations teams. New products are increasingly automated at the back end, freeing staff to focus on genuinely exceptional scenarios and differentiating activities, rather than repetitive low-value activities.

Finally, to ensure maximum value, use cases and capabilities should be designed as “enterprise products” to be reused in other areas. For example, the deployment of microservices handling discrete tasks like document collection and ID verification can ensure consistency in the way things are done across the organization. APIs should also be documented and catalogued for reuse. APIs that are domain- or product-centric (for example, enabling the retrieval of customer details from a single customer store) have higher reusability and take an enterprise-level view of the capability, as compared with a journey-centric API design—for example, one where an API supports retrieval of customer details for a specific mobile journey.

Modern, scalable platform for data and analytics

Delivering highly personalized offers in near real time requires AI-powered decision-making capabilities underpinned by robust data assets. What is more, the at-scale development of machine-learning (ML) models that are context aware in real time requires automated DevSecOps² and machine-learning ops (MLOps) tools to enable secure and compliant continuous integration (CI) and continuous deployment (CD). This entails complex orchestration across source systems, data platforms, and data sciences to enable lab experimentation and factory production. This is particularly complex in a highly regulated environment where the involvement of security, audit, risk, and other functions is crucial in many stages of the process.

The incorporation of feedback loops with channel systems enables models to evaluate the output performance and make automated adjustments to increase the effectiveness of personalized messages, so the organization can generate personalized offers nearly instantaneously. For example, in the case of location-based offers for adjacent products, an organization must be able to overlay in real time customer location and preferences (as reflected in previous transactions) with predefined offers from nearby participating merchants.

Scalable hybrid infrastructure utilizing the cloud

With the continued expansion of customer engagement across bank and nonbank platforms, financial institutions need to create hyperscalable infrastructure to process high-volume transactions in milliseconds. This capability is made possible, in part, by infrastructure as code, automated server provisioning, and robust automated configuration management processes, which together solve the problem of “snowflake” configurations resulting from organic and complex linkages and changes that have accumulated over time.

²DevSecOps tools support the integration of “development, security, infrastructure, and operations at every stage in the product’s life cycle, from planning and design to ongoing use and support.” See Santiago Comella-Dorda, James Kaplan, Ling Lau, and Nick McNamara, “Agile, reliable, secure, compliant IT: Fulfilling the promise of DevSecOps,” May 2020, McKinsey.com.

Hosting these environments on a distributed-network cloud environment allows a balance between paid-up-front baseline storage and computing capacity, on the one hand, and, on the other, elastic on-demand surge capacity without disruptions to service. Self-monitoring and preventive maintenance also are automated, and disaster recovery and resiliency measures run in the background to ensure constant uptime even if incidents evade automated self-repair and require manual intervention. As a result, the risk of disruption to critical operations is minimized, and customer-facing applications run with high availability and responsiveness. The combination of on-premises and cloud-based infrastructure is increasingly relevant in high-volume and high-frequency areas such as payments processing, core banking platforms, and customer onboarding systems. Making workloads “cloud native” and portable allows the work to be moved to the most appropriate platform.

Highly configurable and scalable core product processors

To sustain a leading-edge value proposition founded upon AI and ML capabilities, banks must continually evaluate their core products and identify opportunities for innovations and customizations. Combined with deep understanding of customer needs, enabled by advanced analytics, an organization can anticipate emerging customer requests and design distinctive products accordingly. The need for real-time reconciliation and round-the-clock transaction processing also emerges as a key competitive advantage for financial institutions. For example, with the advent of next-generation core banking platforms, organizations can now develop products that are built for scale and can be readily configured to meet specific customer expectations.³

Secure and robust perimeter for access

It is crucial to ensure that the organization maintains an appropriate cybersecurity posture across the entire technology infrastructure

as protection against vulnerabilities within applications, operating systems, hardware, and networks. Financial institutions should also implement appropriate measures to secure the perimeter and control access to various systems and applications within the organization's infrastructure footprint, including private and public cloud servers and on-premises data centers. For example, transferring workloads from traditional on-premises infrastructure to public cloud requires careful measures to protect customer data, along with a robust strategy for detecting and remediating potential threats and vulnerabilities.

The “classical” approaches of securing the perimeter should be coupled with more modern approaches to limit the impact of intrusions or reduce the “blast radius.” Again, AI has a part to play here, given the advent of increasingly sophisticated network intrusion detection, anomaly detection, and even forensics during postmortems of security incidents.

Start the transformation by prioritizing key changes

To meet these demands, financial institutions will need to transition from a legacy architecture and operating model to an automation and cloud-first strategy. Building the core technology and data capabilities upon a highly automated, hybrid-cloud infrastructure can enable the AI bank to scale rapidly and efficiently as it gains competitive and differentiating capabilities.

The AI-bank capability stack combines core systems and AI-and-analytics capabilities in a unified architecture designed for maximal automation, security, and scalability. Getting to this target state requires a series of complex initiatives to transform the organization's core technology and data infrastructure. These initiatives focus on several key areas: tech-

³Xavier Lhuer, Phil Tuddenham, Sandhosh Kumar, and Brian Ledbetter, “Next-generation core banking platforms: A golden ticket?” August 2019, McKinsey.com.

forward strategy, modern API and streaming architecture, core processors and systems, data management, intelligent infrastructure, and cybersecurity and control tower (Exhibit 2).

Tech-forward strategy

Banks should begin this far-reaching initiative by translating the AI-first vision into an enterprise strategy that merges technology with business, funding investments in innovation with the returns on incremental changes in technology.⁴ Business and technology collaborate as co-owners in designing and managing operating models and outcomes. This “tech-forward” mindset thrives in interdisciplinary teams focused on innovation and led by skilled engineering talent leveraging modern tools and practices for first-

time-right releases. Organizations should also adopt enterprise agile practices for high-velocity engineering teams, with integrated cross-functional teams of business, technology, and functional experts, and external partners using modern approaches to software development, testing, release, and support cycles. In addition, efficient management of the full stack requires governance of the technology function through a standardized set of metrics, along with ongoing tracking of uptime and health for each component of the stack.

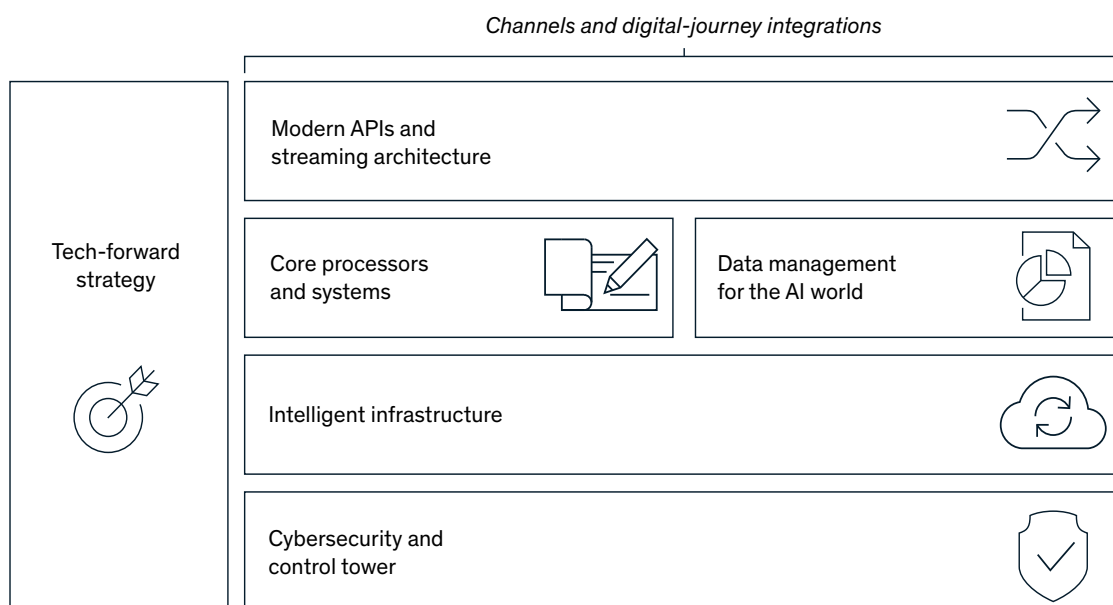
Modern API and streaming architecture

Next, banks should integrate internal and external systems to support seamless customer journeys across internal platforms, partner ecosystems, and numerous external interfaces. This requires

⁴ The technology transformation described in this and other articles in our series on the AI bank of the future aligns broadly with our colleagues’ discussion of the tech-forward approach, which applies across industries. See Anusha Dhasarathy, Isha Gill, Naufal Khan, Sriram Sekar, and Steve Van Kuiken, “How to become tech-forward: A technology-transformation approach that works,” November 2020, McKinsey.com.

Exhibit 2

Building a modern core technology and data infrastructure entails changes in several key areas.



a robust, scalable, and standardized approach to building and hosting integrations and APIs. The APIs, in turn, should be rigorously tested for performance and developed using agile release principles. When a well-defined stock of APIs-as-products are orchestrating flows across systems, product innovations can advance from concept to production and deployment of minimum viable product within 30 to 60 days.

To complement a robust API strategy, technology leaders should also consider establishing a high-speed data-streaming channel to enable standardized asynchronous data transfer across the enterprise in real time.

Core processors and systems

With the right architecture in place, banks can shift away from traditional, complex, and tightly intertwined core systems to lightweight and highly configurable core product processors and workflows. These processors are also complemented by “microservices,” or discrete applications (such as for payments, card accounts, or loans) that “externalize” the logic within traditional core platforms.

The transition to lightweight core processors and systems hosted on scalable, modular, and lean platforms exposed as APIs supports, for example, real-time reconciliation and allows changes to be made in live systems with zero downtime. Use of modern cloud-based infrastructure to host such platforms also makes it easier to scale up.

If successfully implemented, a lightweight processor platform can enable an organization to advance from new-product concept to launch in two to three months. This is a significant advantage against organizations constrained by legacy technology, where launching a new product or customizing an existing product can take six months or more. Assembly of new off-the-shelf product stacks can also enable innovative new customer propositions, such as an end-to-end lending journey on a modern stack using these principles.

Data management for the AI world

It is crucial to establish a modern data and analytics platform to fuel the real-time ML

models of the decision-making layer. The analytical insights generated by these models are deployed through martech tools to craft the intelligent offers and smart experiences that set an AI bank apart from traditional incumbents. In order to support superior omnichannel customer journeys and seamless integration with partner ecosystems, the data platform must be capable of ingesting, analyzing, and deploying vast amounts of data in near real time.

The data platform should also provide scalable workbenches with AI and data-science capabilities to lab and factory teams. These workbenches enable teams to access relevant data sets as they develop models and deploy insights in product iterations. The infrastructure should also support the development of ML models through automated and repeatable processes.

If an organization allows interdisciplinary teams across the enterprise to search and extract data held on the platform, these teams can optimize their data consumption according to customer needs and market opportunities. It is essential to enable data-science teams with appropriate tooling and access to scalable computing power so that they may experiment and innovate. Underpinning these actions, appropriate technical documentation and cataloging of assets (for example, APIs, ML models, data dictionary, DevOps and MLOps tools) ensure proper governance and access control. By creating ML models and scorecards through a well-defined lab-factory model, AI-first organizations empower employees to leverage self-serve, real-time data and analytics infrastructure to guide value-based planning and support daily decision making.

Intelligent infrastructure

Banks then should ensure they have an effective strategy to modernize infrastructure. For this, they should consider the adoption of public cloud to complement the traditional infrastructure in situations where workloads require resiliency, scale, and use of hosted or managed offerings (such as hosted databases). Public cloud enables velocity

through higher levels of automation, templates, and reduction of operational risk. When setting up such environments, banks must build upon the foundational elements of infrastructure management, including observability, resiliency, and high availability, as well as a robust configuration strategy. A well-tuned, scalable, and load-balanced stack can support response times of less than a second while scaling horizontally to cater to variations in transaction volume.

Cybersecurity and control tower

Finally, institutions should address cybersecurity and control. This includes setting up a centralized control tower to monitor data, systems, and networks across the infrastructure. The scope of responsibility includes ensuring boundary security and identifying and rectifying threats and intrusions. Also crucial is to establish a well-defined set of compliance measures for security testing and vulnerability scanning before deploying assets on live systems. These measures reduce the risk posed by potential threat scenarios.

Technology leaders should prioritize interconnected capabilities

Given the broad scope of components to be transformed, organizations should bear in mind that optimal outcomes are much likelier when they first establish a holistic strategy for technology transformation. Unfortunately, not all have found the resources to embrace fully the potential offered by the rapid advancement of AI technologies and the steady rise in customer expectations. Some financial institutions, despite seeing the imperative to change, have maintained and modernized their legacy platforms. Various business lines have set up organically built platforms upon this foundation, making it costlier and more and more complex

to maintain. Many organizations have spent billions of dollars on multiyear technology initiatives within silos, only to find that they fail to generate the scale benefits required to justify investments. Leaders should heed these lessons, adopt a holistic perspective, and map priorities according to the end-to-end impact that each step in the technology transformation has on the value of the enterprise.

If an organization meets the strategic demands outlined at the top of this article, the implementation of modern core technology and data infrastructure can yield significant value in the form of faster delivery of changes and improvements, increased cost efficiency, higher quality of assets, and stronger customer outcomes. For example, a sound DevOps and release-management strategy can contribute to a 25 to 30 percent increase in capacity creation, a reduction in time to market of 50 to 75 percent, and more than a 50 percent reduction in failure rates.⁵ In turn, development efforts can improve schedule adherence by 1.5 times and reduce customer defects by 20 to 30 percent through process automation and agile ways of working,⁶ and leading organizations have improved issue-resolution time and planning time by between 30 and 50 percent.⁷ There are indirect benefits as well: by empowering employees with a clear mission, autonomy, and strong focus on customers, agile organizations have been able to increase employee engagement by 20 to 30 percent, as reflected both in willingness to recommend their workplaces and in employee-satisfaction surveys.⁸

Technology transformations are fraught with risk, including delays and cost overruns, and only those organizations whose leaders are prepared to commit the energy and capital necessary to carry through with the comprehensive effort should embark on the journey. Ultimately, this is a decision not just to survive, but to thrive, and it requires a change in mindset. Specifically, traditional financial institutions will need to break out of their legacy

⁵Thomas Delaet and Ling Lau, "DevOps: The key to IT infrastructure agility," March 2017, McKinsey.com.

⁶Matt Brown, Ankur Dikshit, Martin Harryson, Shivam Srivastava, and Kunal Thanki, "A new management science for technology product delivery," February 2020, McKinsey.com.

⁷Wouter Aghina, Christopher Handscomb, Jesper Ludolph, Daniel Rona, and Dave West, "Enterprise agility: Buzz or business impact?" March 2020, McKinsey.com.

⁸"Enterprise agility," March 2020.







technology architecture and explore AI-and-analytics opportunities. Should they undertake the challenge and begin thinking about how best to chart their course to becoming an AI bank, their leaders may consider 12 key insights gleaned from the experience of financial-services leaders that are in the process of carrying out such transformations (Exhibit 3):

enable repeatable execution and development of capabilities within technology teams and to promote standardization to speed up execution. For example, a core system factory consisting of teams, predefined operating procedures, and systems to manage, prioritize, and execute changes across business units can expedite deployment of new solutions significantly.

1. *Consider the factory model to build at scale.*
Leverage a factory approach in fast-evolving and critical areas of the transformation to
2. *Consider insourcing differentiating capabilities.*
Based on the eventual outcomes desired, build certain differentiating capabilities in-house,

Exhibit 3

Leaders should consider 12 key insights as they embark on the technology-transformation journey.

	Tech-forward strategy	<ul style="list-style-type: none"> ✓ Consider the factory model to build at scale ✓ Consider insourcing differentiating capabilities
	Modern APIs and streaming architecture	<ul style="list-style-type: none"> ✓ Maintain rigorous documentation on integrations ✓ Identify an anchor stack but experiment with others
	Core processors and systems	<ul style="list-style-type: none"> ✓ Maintain automation-first and fast-release posture ✓ Consider a modern core for high-velocity areas
	Data management for the AI world	<ul style="list-style-type: none"> ✓ Adopt a value-centric approach to building data platforms ✓ Set up a lab and factory for analytics
	Intelligent infrastructure	<ul style="list-style-type: none"> ✓ Define the enterprise cloud strategy ✓ Establish end-to-end visibility across the stack
	Cybersecurity and control tower	<ul style="list-style-type: none"> ✓ Identify the right perimeter design for the cloud ✓ Ensure data security on the cloud

with robust engineering support, perhaps starting with APIs, infrastructure, or the data and analytics platform.

3. **Maintain rigorous documentation on integrations.** Remember that the development of engagement systems and comprehensive changes in core-technology require significant adjustments to integrations, and substandard documentation of the specifications for these integrations often slows the broader initiative to transform the bank.
 4. **Identify an anchor stack but experiment with others.** Emphasize the importance of standardization for engineering-centric development at scale, and build on a single stack to support faster change. At the same time, continue experimenting with other stacks and stack components for smaller builds in order to adopt alternative or newer approaches where the incremental benefits are clearly defined.
 5. **Maintain an automation-first and fast-release posture.** Adopt an automation-first and frequent-deployments posture on fast-evolving applications and stacks. While initial hiccups are not uncommon, release rails should be hardened over time to speed up time to market. Well-defined release management and deployments are key to execution velocity. Standardizing through DevSecOps typically unlocks productivity gains of as much as 20 to 30 percent.
 6. **Consider a modern core for high-velocity areas.** Consider modern and lightweight core systems built on scalable and hybrid infrastructure to enable an efficient rollout of new capabilities while enabling a modular build of financial products.
 7. **Adopt a value-centric approach to building data platforms.** Take advantage of the fact that data and analytics platforms evolve over time, and do not allow teams to be overwhelmed by the rapid shift of tooling and available technology. We have observed that organizations that budget the anticipated return of change efforts are able to prioritize use cases that are functionally simple, fit the road map for building the platform in iterations, and realize economic value along the way.
 8. **Set up a lab and factory for analytics.** Establish a lab to experiment with tools and platforms for efficient development in test-and-learn cycles. Also, build a central factory for producing and deploying analytics use cases at scale on an individual stack.
 9. **Define the enterprise cloud strategy.** Create a common strategy across stakeholders to enable a structured and systematic migration to the cloud. Cloud adoption poses multiple firsts in the enterprise in terms of security perimeters, change management, and cloud-migration and disposition strategy.
 10. **Establish end-to-end visibility across the technology and infrastructure stack.** Recognizing that at-scale digital transformations impose limitations on volume and scale, implement robust automated tools to observe stack performance and to diagnose and resolve issues.
 11. **Identify the right perimeter design for the cloud.** To safeguard against potential malicious attacks on cloud-based public-facing applications, design an appropriate network perimeter that optimizes the potential attack radius.
 12. **Ensure data security on the cloud.** Design robust data-categorization and data-security safeguards to avoid critical customer-data combinations and comply with national data-protection and data-residency laws.
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If banks are to thrive in a world where customer expectations are increasingly shaped by the AI-and-analytics capabilities of technology leaders, they must rebuild their core technology and data infrastructure to support AI-powered decision

making and reimagined customer engagement. These are the three “technology layers” of the AI-bank capability stack. The full stack also includes a leading-edge operating model to ensure that all layers work together in unison to deliver intelligent propositions through smart servicing and experiences. The AI bank of the

future requires an agile culture and platform-oriented operating model that respond promptly to emerging opportunities and deliver innovative solutions rapidly at scale. The next article in this series examines the crucial elements of the platform operating model.

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Global Banking & Securities

Platform operating model for the AI bank of the future

Technology alone cannot define a successful AI bank; the AI bank of the future also needs an operating model that brings together the right talent, culture, and organizational design.

by Brant Carson, Abhishek Chakravarty, Kristy Koh, and Renny Thomas



As we noted at the beginning of this series on the AI bank of the future, disruptive AI technologies can dramatically improve banks' performance in four key areas: higher profits, at-scale personalization, smart omnichannel experiences, and rapid innovation cycles. The stakes could not be higher, and success requires a holistic transformation spanning all layers of the organization's capability stack.

Our previous articles have focused on the capability stack's technology layers: reimagined engagement, AI-powered decision making, and modern core technology and data infrastructure. Leveraging these capabilities to create value requires an operating model combining structure, talent, culture, and ways of working to synchronize all layers of the stack. Synchronizing these layers is not easy. Any organization undertaking an AI-bank transformation must determine how to structure the organization so that its people interact and leverage tools and capabilities to deliver value for each customer at scale. In this article, we take a closer look at the need for a platform operating model, the categories and scope of operating models, and the building blocks of effective models.

The heart of an AI bank is always-on customer interaction

The need to change a bank's operating model arises from a combination of external and internal circumstances. Externally, as consumers and businesses increasingly rely on AI technologies in daily life, banks are shifting the foundation of their business models from products to experiences. In other words, as many traditional banking products become embedded—or even “invisible”—within beyond-the-bank journeys, experiences become the more salient element of a customer's relationship with the bank. This shift involves a rapid increase in the number of customer interactions, and at the same time, the revenue associated with each interaction is declining. This is a fundamental change: just a few years ago, customers conducted business with the bank by visiting a branch once or twice a month; more recently, they would conduct transactions several times each week through the bank website; now many customers interact with their bank daily through their mobile banking app,

and often several times a day through wearable devices. In short, banks and their customers now have an interconnected, always-on relationship.

Circumstances within the bank are changing as well—albeit at a slower pace, due largely to the complexity of legacy technology and operating models coupled with the steadily rising cost of maintaining and upgrading IT infrastructure. Siloed structures also hamper organizations' ability to transform themselves. Decision making at traditional banks is typically slow and cumbersome, and ineffective prioritization (done at too high a level without understanding underlying resource contentions) results in frequent project delays and cost overruns. Insufficient domain expertise and blurred accountability—particularly between business units and technology teams—too often cause new solutions to fall short of customer expectations. What is more, multiple systems perform similar functions, and the increasing complexity of IT architecture with a proliferation of applications weakens system resilience and stability and increases risk when changes are made.

The widening divide between fast-evolving customer expectations and inertia within the bank reinforces silos and weakens the bank's ability to respond to the demands of the new machine age. The challenge for leaders is to shift the organization from this siloed structure to a radically flattened network of platforms.

Platforms focus on delivering business solutions

Today, banks that recognize the value of AI and technology enabling better customer and business experiences are moving steadily toward a platform operating model, leveling command-and-control structures to speed decision making and bring people together in teams relentlessly focused on delivering solutions that customers value. In this agile approach, each platform can be thought of as a collection of software and hardware assets, funding, and talent that together provide a specific capability. While some platforms, such as those for retail mortgages, deliver business-technology solutions to serve internal or external clients, others

enable other platforms with shared services and support functions (for example, payments and core banking). Each platform is largely self-contained in producing business and technology outcomes and autonomous in prioritizing its work to meet strategic goals within clearly defined guardrails, such as common standards, finance, and risk control.

Platform elements

As banks think about setting up a platform operating model, they should bear in mind that each platform comprises three main elements. When structured correctly, these elements will help a platform team set its North Star and carry out its mission in a way that creates value for customers and the enterprise.

- *Strategy and road map.* The joint vision combines business and technology outcomes to deliver end-to-end value. Close alignment between the business unit and the technology group on performance objectives and agenda unites all members of the platform around a shared strategic vision, with a road map for executing priorities that balance change and resiliency.

- *Organization and governance.* Organization of business-facing platforms (e.g., retail mortgages) should be based on a “two in a box” engagement model, meaning business and technology leaders own joint performance metrics that track both commercial and technological outcomes. Each platform manages its business and technological priorities through a shared backlog of work and delivers through persistent cross-functional agile teams, each of which builds its platform over time and focuses not only on one project, but continually improves the platform.
- *Technology.* Each platform owns its technology landscape and standardized interaction mechanisms with other platforms (for example, leveraging APIs). It also has an inherent objective to modernize its technology.

Platform categories

In most cases, a platform can be thought of as a nimble fintech group in one of three main categories: business platforms, enterprise platforms, or enabling platforms (Exhibit 1).

Exhibit 1
The platforms crucial to a bank’s success can be grouped into three categories.

				Example platforms
Business platforms	Platforms directly aligned to a business unit to deliver business and technology outcomes (eg, revenue growth, profitability)			Consumer lending Cards Wealth management
Enterprise platforms	Platforms aligned to multiple business units to deliver outcomes across units	Enterprise shared services	Act as service providers largely enabling other platforms	Core banking Payments Analytics and data
	Tech assets providing similar services aggregated to create a center of excellence	Enterprise support units	Act as business owners delivering services across the enterprise	Finance Risk HR
Enabling platforms	Platforms not aligned to a business unit <ul style="list-style-type: none"> • Provide scale benefits through consolidation • Safeguard the bank by defining guardrails • Enable business and enterprise platforms to deliver business outcomes 			Enterprise architecture IT infrastructure Cybersecurity

Business platforms are aligned to business units and deliver joint business-and-technology outcomes. As an example, a business platform for consumer lending would include several cross-functional teams, each of which owns front-end technology assets and includes business teams for a specific function or service area.

One team might focus on preapproval and new-customer acquisition, with responsibility for next-generation credit-scoring models using traditional data sources (such as credit bureau reports and internal transaction histories) and nontraditional sources (including, upon the customer's permission, tax returns, online presence, partner ecosystem transactions, and more). Another team often takes responsibility for loan underwriting, determining credit limits for individual accounts in accordance with enterprise risk policy. A third team might focus on consumer insights and personalized messaging, including machine-learning decision models and marketing technology ("martech") tools to deliver intelligent credit offers to new and existing customers. The customization team owns the design, development, and management of product configurations to ensure that each solution addresses the customer's precise needs.

Other teams focus on services and capabilities to support external developers and other technology partners, including, for example, partner onboarding and sandbox management and APIs supporting customer journeys and experiences (managing standards and documentation through development hubs or platforms). Still other teams support the consumer lending platform by managing technology—for example, provisioning of cloud infrastructure.

Enterprise platforms enable diverse business platforms by providing shared services such as vendor management and procurement, standardization of cloud and DevSecOps tooling,¹ build-to-stock process APIs and reusable

microservices, and standardized data access and governance. Other enterprise platforms aggregate support functions such as finance, risk, and human resources within a center of excellence.

Enabling platforms support other platforms by ensuring that technical functionality is delivered quickly and securely at scale. This approach has proven effective at maximizing scale benefits while protecting the enterprise with standardized processes. Examples of enabling platforms include core technology infrastructure, DevOps tools and capabilities, and cybersecurity.

Implementing a platform operating model requires five main building blocks

The distinct advantage of a platform operating model is the foundation it provides for business-and-technology partnerships focused on delivering leading-edge AI-enabled solutions (Exhibit 2). As they begin planning the transition from hierarchical silos to a network of horizontally interconnected platforms, bank leaders should focus on five main building blocks: agile ways of working, remote collaboration, modern talent strategy, culture and capabilities, and architectural guardrails. The value and efficiency that can be derived from platform operating models are possible only if organizations design their operating model to enable these five elements. Once they have established their vision of the new management approach, they should develop a road map for implementing the platform model.

1. Agile ways of working

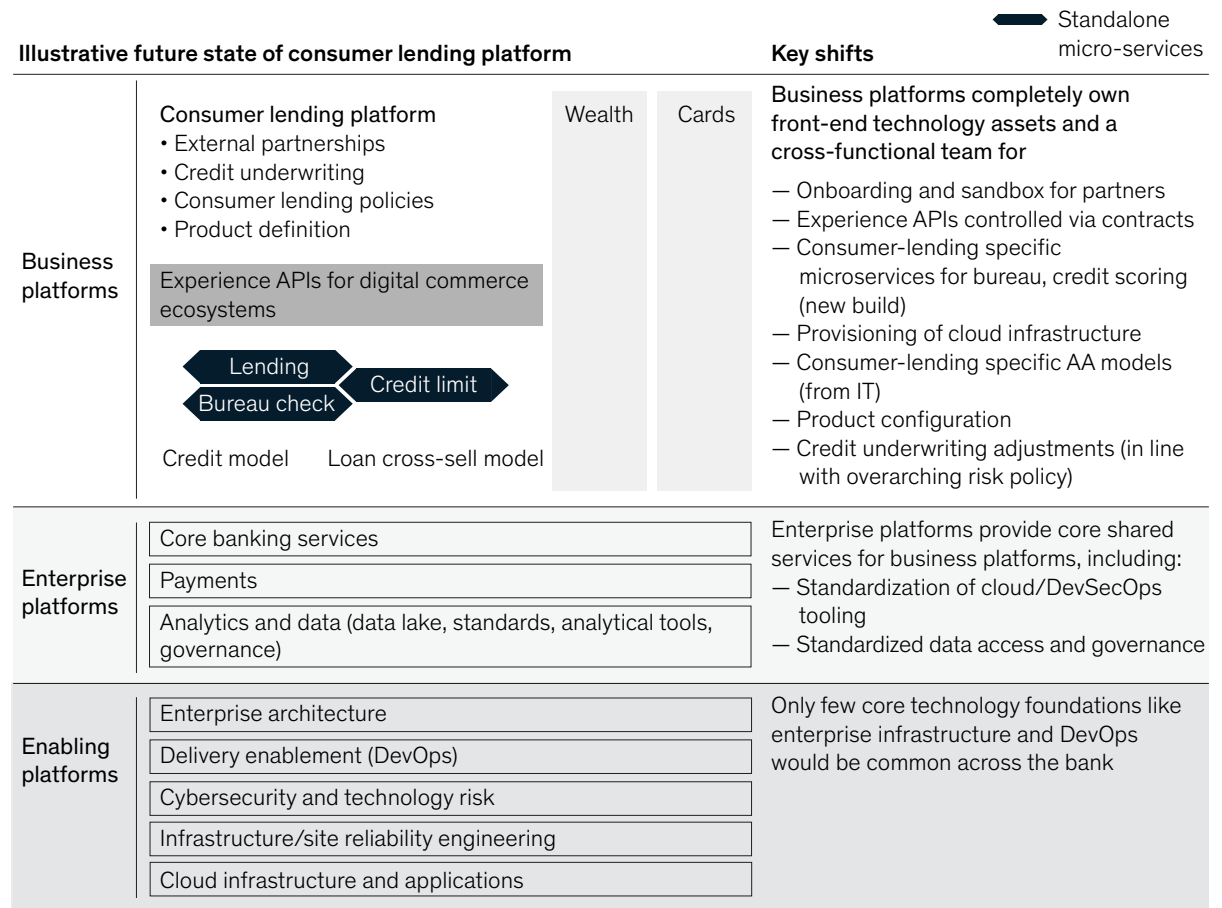
By extending the platform structure to all groups, an organization gains the ability to quickly redirect their people and priorities toward value-creating opportunities.² For this model to work, however, banks need to develop agile mindsets within each team and equip team members with agile ways of working, such as rapid decision and learning cycles, breaking initiatives into small units of

¹DevSecOps tools integrate security measures with DevOps processes.

²Wouter Aghina, Christopher Handscomb, Jesper Ludolph, Daniel Rona, and Dave West, "Enterprise agility: Buzz or business impact?," March 2020, McKinsey.com.

Exhibit 2

The platform operating model for consumer lending captures the agility of a fintech and scale of a large enterprise.



work, piloting new products to get user input, and rapidly testing operational effectiveness before scaling.³ This methodology, when deployed across the organization, underpins a new corporate culture that enables fast communication and collaboration within and among platforms. It gives the organization a strong and stable backbone for developing and scaling dynamic capabilities.

The starting point depends on where the bank is in its technology transformation. Some may set up an agile pilot within a platform and gradually train other groups in the new practices. For banks where

diverse groups have already achieved a degree of organizational and operational flexibility, the time may be right for an end-to-end transformation program that “flips” the organization to agile.

Each platform consists of one or multiple squads or pods combining IT, design, and customer-journey experts, among others (up to nine people). Banks should also create “chapters” as cross-squad groups of employees with similar functional competencies to ensure growth of expertise and cross-training of colleagues across technologies. In some cases, a bank will need to create new roles,

³Anusha Dhasarathy, Isha Gill, Naufal Khan, Sriram Sekar, and Steve Van Kuiken, “How to become tech-forward: A technology-transformation approach that works,” November 2020, McKinsey.com.

such as tribe leaders and agile coaches. It is also crucial to adopt a performance-management model that aligns all individuals with team goals.

The agile way of working is a means to an end, not an end in itself. As banks begin to implement a platform operating model, it is crucial that they set a North Star, not only to unite people around business goals but also to offer them a sense of meaning and purpose within society. Shared values reinforce team spirit and—when combined with opportunities to learn, experiment, and make a difference for customers—strengthen employee engagement. This stronger employee engagement can be measured in, for example, productivity and loyalty and can indicate how well an organization has embraced the agile transformation.

2. Remote collaboration

For a variety of reasons, including geographic distribution, work-from-home policies, travel restrictions, and other disruptions due to COVID-19, banks have moved to a fully or partially remote model. The sharp decline in co-location has put pressure on organizations to improve collaboration and consistency in ways of working. Given the expectation that a significant share of bank employees may not return to shared work environments,⁴ banks need to develop mechanisms to support effective collaboration—and thus reduce errors—in distributed environments.

Indeed, banks need to revisit agile teams after an abrupt shift to remote models⁵ and consider the types of work to be done remotely according to how well interaction models and system readiness can be adapted. Two criteria are key for determining which roles can function effectively in remote work arrangements. First is the required level of human interaction, such as the degree of real-time collaboration and creative work among groups of people and the degree to which work can be segmented and individualized. Second is bank systems' readiness—particularly in terms of data

accessibility, software accessibility, and tooling—to support secure and efficient remote work.

For example, setting clear decision-making and escalation paths is essential to maintain a fast cadence. Shared workflows, roles, and responsibilities help move work through the pipeline for even the most complex and highly interactive jobs.

Setting up a single source of truth or single backlog of work also helps keep different platforms aware of interdependencies. What is more, banks can and should ensure the security of remote working arrangements by leveraging specialized technology for managing remote access. Areas subject to management may include data retrieval (role-based access to data, restrictions in downloading sensitive data, restriction of all data copying even on encrypted removable hard drives), sophisticated detection (tracking and monitoring mechanisms to detect data breach), and governance procedures to review breaches and enforce corrective actions.

Banks should also set up mechanisms to address both interaction and security criteria. These mechanisms are particularly crucial for remote-working arrangements, which are increasingly important to top talent in technology-intensive industries, including financial services.

3. Modern talent strategy

A modern talent strategy for an AI bank is not only about the commitment and capability to hire the best engineering talent or the best business talent. The AI-bank operating model also requires leaders to rethink their strategy for hiring and retaining top talent in a world with blurring lines between business, IT, and digital expertise. Leaders must form a detailed picture of the diverse skills and expertise required to deliver business-technology solutions. Reskilling is equally critical to building teams with the right mix of talent.

⁴Susan Lund, Anu Madgavkar, James Manyika, and Sven Smit, "What's next for remote work: An analysis of 2,000 tasks, 800 jobs, and nine countries," McKinsey Global Institute, November 2020.

⁵Santiago Comella-Dorda, Lavkesh Garg, Suman Thareja, and Belkis Vasquez-McCall, "Revisiting agile teams after an abrupt shift to remote," April 2020, McKinsey.com.

This strategy focuses on attracting digital talent and requires that leaders understand the unique needs of digital talent. It employs a diversified approach to recruiting: engaging with technologist communities, sponsoring hackathons to scout talent, and ensuring that recruiters have experience in technology. The best technical talent has a disproportionately higher impact, so the ability to attract and develop superior candidates is crucial. In a similar vein, leading tech organizations enlist their top performers in the recruiting effort.

Furthermore, banks need to improve retention and reskilling. Reskilling may involve charting a clear career development path for digital talent, creating an environment that prioritizes and rewards learning, and rewarding deep expertise over fungible skill sets. There is also opportunity to build capability-development programs that help reskill nontechnical colleagues as technologists. Finally, so that attracting and developing digital talent can produce the desired results, banks need a clear strategy for retaining this talent, such as providing flexible and collaborative ways of working and empowering digital talent to implement change.

To develop a comprehensive talent strategy, an AI bank would first review existing initiatives, the structure and makeup of each platform, and the technical talent required to execute the strategy. The second step is to build from the ground up a model of talent required for the next stage of growth, including both existing and future initiatives. Next, it is important to create a set of talent interventions that can tap into existing talent within the organization, developing an “ecosystem” of partners (vendors, developers, gig workers, remote talent, and others) and using hiring mechanisms, including the acquisition of smaller companies and start-ups, to establish platforms requiring skills beyond the traditional scope of the bank’s roles and capabilities. Finally, banks have to make themselves externally appealing to fresh tech talent and internally exciting for their people. This means transforming themselves so top technical talent

want to stay and grow within the organization and so all employees see and embrace the change and invest in upgrading their skills. In short, banks need to become great engineering organizations.⁶

4. Culture and capabilities

As banks build sophisticated technical solutions, they also need to develop a culture suited to the experts building these solutions. Organizations need to manage culture and capabilities to create a virtuous circle that attracts talent, sparks innovation, and creates impact. This underscores the importance of talent and culture in tech-enabled transformations,⁷ including AI-bank transformations.

For the platform operating model to work, leaders need to steer their organizations to focus on the end user, collaborate across silos, and foster experimentation. Establishing this digital culture across the bank involves addressing four dimensions of culture: understanding/conviction, reinforcement, reskilling, and interaction.

First, understanding and conviction follow largely from the bank’s leadership, expressed through role modeling and encouraging desired behaviors, including continuous learning, knowledge-sharing, and interdisciplinary collaboration. For example, if a top team visibly takes part in upskilling programs for AI and machine learning, this demonstrates to all in the organization the importance of automation and evidence-based decision making to all parts of the business. Another approach is to support technology start-ups by giving them access to nonsensitive code and shareable data to build their own “open solutions” related to AI banking.

The second is to reinforce new practices with formal mechanisms, so that the structures, processes, and systems of the AI bank become embedded within the culture. For example, banks might consider organizing institution-wide innovation challenges or inviting managers to daily huddles where they actively work with the centers of excellence to solve problems and own outcomes.

⁶ Abhishek Chakravarty, Dave Kerr, and Nina Magoc, “10 Principles That Build Great Engineering Organizations,” March 26, 2021, medium.com.

⁷ Reed Doucette and John Parsons, “The importance of talent and culture in tech-enabled transformations,” February 2020, McKinsey.com.

Third, leaders need to ensure that every individual has access to the skills they require to be effective. One way to do this is by developing entirely new tools and technology using in-house open-source systems. Another is to ensure transparency by setting up digital wikis that anyone can use to access knowledge. Organizations can also learn from others by sending employees on “innovation tours” or actively encouraging and sponsoring attendance at high-quality conferences.

Finally, leaders should model various approaches to interaction. Banks can visibly change the ways managers interact with teams, such as by moving from meetings to offline asynchronous communications using highly collaborative tooling. Leaders can also use symbols in remote and in-person meetings to emphasize enterprise values such as customer centricity. At a leading bank, for example, every meeting has an empty chair to remind participants of the customer for whom they are building solutions.

5. Architectural guardrails

Each platform is responsible for its own technology landscape, but standardized mechanisms for interaction among platforms should be jointly designed across all platforms. It is important, therefore, to ensure that architectural guardrails are observed so that each platform can easily interact with others. These guardrails should not be perceived as restricting platforms from developing and improving their own technology and technical decisions.

As each platform is free to build the technology elements required to deliver on its mandated business goals, there is potential for miscommunication among platforms. For example, instead of developing its own interest rate calculation, a consumer lending platform would leverage a single, standard calculation via an API. With no guardrails in place, there would be significant inefficiency, because efforts would be duplicated in some areas and tasks would be unfinished in others. By contrast, guardrails support efficient management and operation of the overall IT landscape, with responsibility for various elements of the enterprise architecture delegated to

individual platforms. These various responsibilities are formally documented and communicated widely. Without such guardrails, inefficiencies would multiply.

These architectural guidelines should focus on strategic activities rather than operational tasks, which are subject to the discretion of the platform. This requires significant time upfront for strategic planning, and each platform must stay alert to new value-creation opportunities related to its mandated strategic objectives.

Further, platform owners can evaluate the effectiveness of these guardrails by tracking the number of business capabilities in accordance with these guardrails, rather than simply counting the various technology applications found within the organization.

Mapping the operating model of a financial-services organization

A large global or regional AI bank implementing a platform-based operating model would typically have 20 to 40 platforms, each focused on a specific type or set of services, such as payments, lending, infrastructure, or cybersecurity (Exhibit 3). As noted above, these platforms are often grouped into one of three areas.

- Business platforms typically include a consumer platform, which is linked to channels (digital, branch) and products (wealth, consumer) as well as customer relationship management and analytics; a corporate platform, which spans channels and products (transaction banking, lending) and relationship management (corporate servicing); and a global-markets platform, which covers channels, products, and global market operations, as well as market and credit risks.
- Enterprise platforms provide shared services across different business platforms across the enterprise on administrative elements such as customer servicing; employee services; finance; HR; risk, legal, and compliance; and technology platforms usable by business platforms such

Exhibit 3

If implemented across the bank, the platform operating model can enable each group to optimize performance.

	Consumer platforms	Corporate platforms	Global Markets
Business platforms	Digital and assisted digital channels	Digital and assisted digital channels	Digital channels
	Branches and self-service banking		Trading
	Wealth products	Transaction banking (securities and fiduciary services, trade finance and cash management)	Product control
	Consumer products		Global markets operations
	Consumer banking operations	Lending and other products	Market risk
	Customer marketing and analytics	Corporate servicing and operations	Credit risk
		Customer marketing and analytics	Sales and analytics
Enterprise platforms	Payments utility (fulfilment and settlement, payment interfaces, remittances)		Finance and HR (recruiting, talent management, HR policies, accounting)
	Customer servicing (reconciliation, digital servicing)		Risk (credit, market, operational, and liquidity risk)
	Analytics and data (data lake, standards, analytical tools, governance)		Compliance
	Employee services (intranet, facilities booking, video conferencing, end-user computing)		Group services (eg, strategic vendor management, real estate, project management office)
	Core banking		
Enabling platforms	Enterprise architecture (application/data/infrastructure architecture, API standards)		
	Delivery enablement/ITSS (DevOps, agile, test automation, service monitoring)		
	Access management (eg, single sign-on, authentication, token management)		
	Cybersecurity and technology risk		
	Infrastructure/site reliability engineering		
	API management (tech and operations for all APIs)		
	Cloud infrastructure and applications		

as payment infrastructure, cloud infrastructure, data, and API management.

- Enabling platforms support business and enterprise platforms to deliver technical functionality quickly. These platforms include enterprise architecture, delivery enablement, access and authentication management, cybersecurity, and infrastructure/site reliability engineering (SRE).

The platform model can help organizations seize new opportunities

Executing on a platform operating model is arduous. However, when done correctly, it has the potential to deliver four main benefits to all stakeholders: value-oriented business-technology partnerships, stronger performance (speed, efficiency, and productivity), transparency, and a future-ready business model.

The collaborative framework of the platform model brings business and technology leaders together as co-owners in creating value for the enterprise. Joint owners of business-facing platforms share accountability for outcomes, merging business knowledge of market opportunities with expert insight into how technological advances can enhance customer experiences. The leader of the platform facilitates the interaction of business and technology owners in determining the right balance between run-the-bank and change-the-bank initiatives. All members of a particular team are unified in delivering a solution (just as those of the entire “tribe” of a platform are focused on a service line) in order to create value in alignment with enterprise strategic objectives. This unity is reinforced by the fact that all team members share in performance metrics for both business and technology outcomes, including impact on users (internal and external), on-time delivery of solutions, customer and employee satisfaction ratings, and more.

The platform approach can strengthen an organization’s performance in terms of speed, efficiency, and productivity when each platform is large enough to address a set of use cases crucial to realizing the business model of the enterprise but small enough to keep the team agile. Each team enjoys a degree of autonomy, with a budget and mandate to experiment and discover the best way to maximize value within a discrete domain in alignment with predefined guardrails (for instance, finance, risk, compliance) without having to wait for approvals from finance and allocations from IT and human resources. This autonomy speeds up decision making, innovation, and solution delivery. The use of automated tools, enterprise standards, and agile patterns of communication and collaboration increases efficiency in two ways. First, this approach minimizes duplication of effort by documenting repeatable processes and cataloging technology tools and analytical models available for deployment in diverse contexts. Second, it allows individuals to access data (according to clearly defined need-to-know criteria) and advanced analytical tools to extract insights to augment their impact. Over time, persistent agile teams build their

domain expertise and agile skills for collaboration and timely delivery.

In addition to the emphasis on interdisciplinary collaboration, the platform model is designed to increase transparency, accountability, and knowledge sharing to the fullest extent possible. Transparency should be high not only so employees can clearly identify the services available from each platform but also to support independent benchmarking of team performance and identification of best practices. Each platform should also be clear about how it prioritizes work, tracks initiatives in the pipeline, and manages the backlog.

Finally, shifting to a platform model can help an organization future-proof its business model because each platform is incentivized to continuously improve on its technology landscape. Within a culture of continuous learning, team members are accustomed to change and adept at finding the best response to fast-evolving circumstances. Interdisciplinary initiatives led by business-technology co-owners strengthen a team’s capacity to anticipate and consider potential challenges and opportunities before they appear on the horizon. Enterprise-wide standards, rigorous documentation of processes, and consistent cataloging of technology assets enable teams to apply best practices as they develop and implement new solutions.

By underpinning business-technology co-ownership of solutions delivery and value creation, the platform operating model offers banks an opportunity to maximize the impact of their technology capabilities in ways that count for customers. The implementation of the platform model begins logically with the formation of joint business-and-technology teams focused on the design, development, and implementation at scale of new AI-bank innovations, always striving toward a more intelligent value proposition and smarter experiences and servicing. Further, the creation of cross-functional platforms is also an excellent

approach to increase business–technology collaboration, developing an IT operating model that generates immediate and tangible business value and moves the full organization, not just technology, to an agile way of working. However, to derive maximum value from platforms and the people who make up these platforms requires new skills, mindsets, and ways of working. Bringing all

these elements together is a powerful mechanism to optimize the full capability stack, from core technology and data infrastructure to AI-powered decision making and reimagined customer engagement. The platform operating model ensures that these layers run in sync to spur the growth of an AI bank of the future.

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