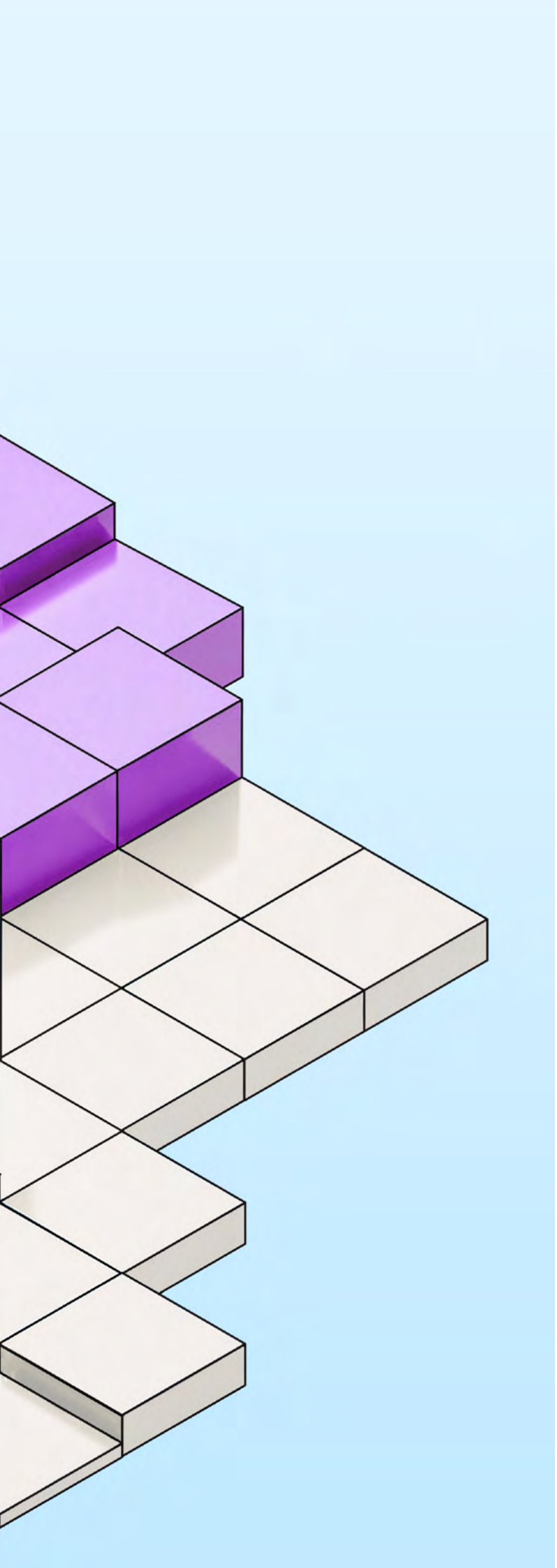
The 94% core banking problem

What derails modernization—and actionable insights from CIOs

IBM

BIAN® Banking Industry Architecture Network



Contents

How IBM can help

Modern financial institutions demand modularity, security, openness, AI-driven capabilities, and collaboration on a hybrid cloud. At IBM, we empower you to elevate customer experiences, modernize core banking infrastructures, pioneer innovative payment solutions, and transform enterprise risk management. Learn more at ibm.com/industries/banking-financial-markets

How BIAN can help

Financial institutions use BIAN as a starting point to help define and organize their IT software and services needs in a standard, rationalized way around the BIAN service landscape. This in turn increases an organization's agility to deliver the needs of its customers. BIAN provides an industry model for creating an architectural framework that makes integration of software and services capabilities easier and faster through a standard set of definitions. The model is supported by 250 pre-defined APIs. Learn more at bian.org

Foreword

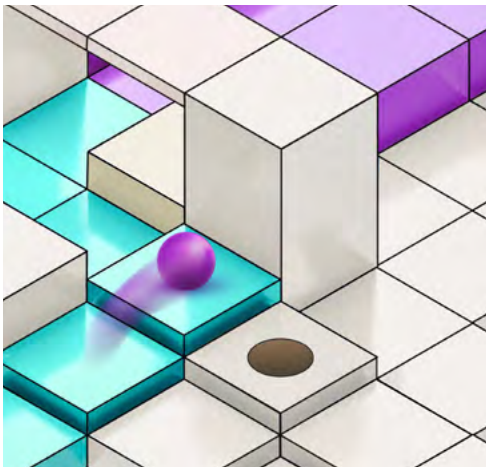
Over the last decade, banks poured substantial resources into cloud-native core banking modernization, envisioning a future of seamless digital excellence. Yet, our research paints a sobering picture: Core modernizations remain mired in pitfalls, from cost overruns and delays to underwhelming returns on investments. Strikingly, in our examination of desired business benefits—ranging from operational efficiency to enriched customer experiences—less than half of banking CIOs reported meaningful gains.

From these shortcomings, CIOs have distilled several hard-won lessons. The imperative is clear: AI must be harnessed to speed up development—combined with industry standards to sort out application chaos—and CIOs must be more deliberate in defining hybrid cloud strategies. They also recognize the power of reimagined operating models with greater business and technology alignment.

Equally important is robust risk management. Without trust and resilience embedded in every step of transformation, AI-driven modernization efforts risk compounding fragility rather than enabling progress. Risk governance thus becomes the bedrock on which these other enablers—AI, standards, hybrid cloud, and modular models—can deliver sustainable impact.

As competition intensifies within financial services and AI innovation surges forward, successful core banking modernization stands as a decisive watershed between stagnation and growth. Institutions that master this combination of lessons and enablers will liberate unparalleled efficiency and foster exponential growth in an AI-driven era.

Shanker Ramamurthy
Global Managing Partner, Banking and Financial Markets
IBM Consulting



Key takeaways

Already 17% of banks are planning 2026 agentic AI launches, 42% are piloting now—and 55% are targeting smarter data handling and analysis of documentation.

CIOs unearth gold by turning setbacks into insights.

94% of banking overhauls extend beyond their planned timelines, resulting in delays that negatively impact ROI. Yet CIOs learned invaluable lessons, including the role of AI in spurring development, how industry standards can untangle application chaos, and the importance of creating deliberate hybrid cloud strategies.

AI can turbocharge banking transformation, but risk management demands attention.

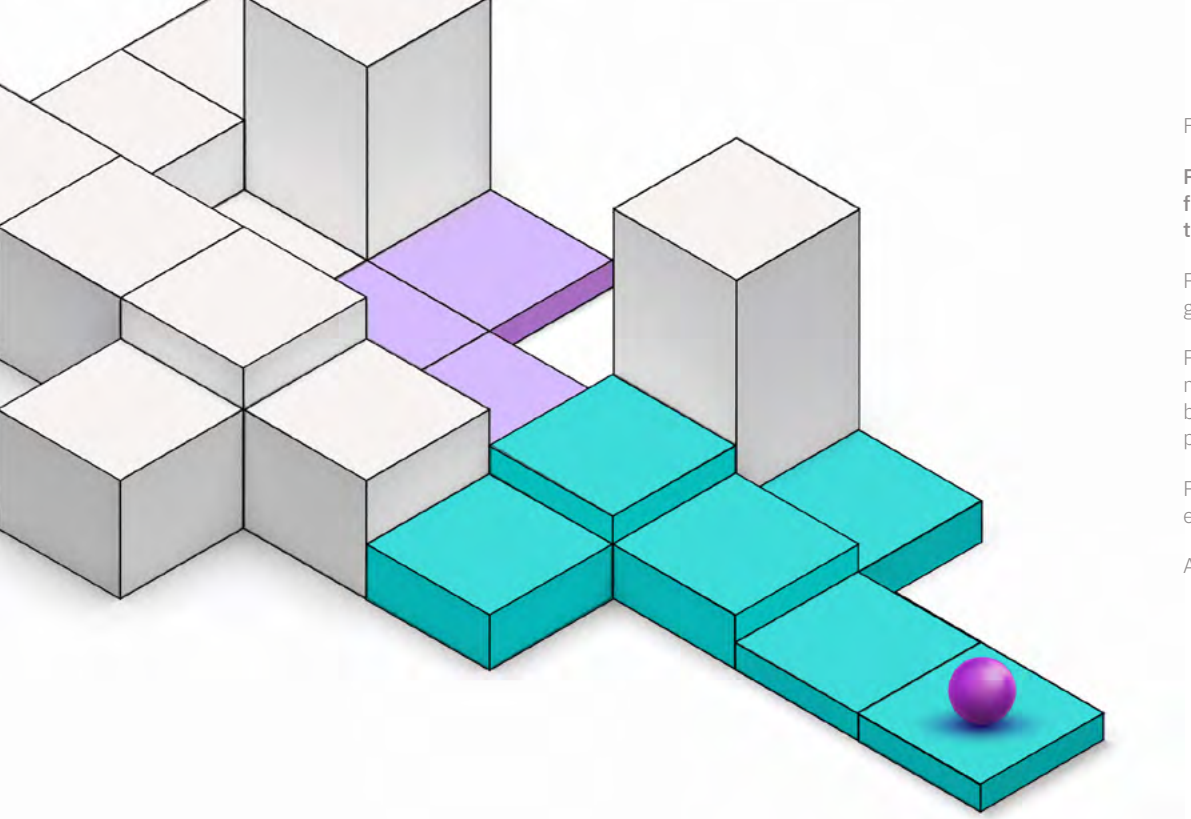
With 51% of banks already harnessing AI to accelerate development—surging to 92% by 2028—CIOs are expediting modernization efforts. But only 33% of CIOs are on the lookout for vulnerabilities in risk control and validation support for scaling AI enterprise-wide. As investments surge into AI platforms, neglecting trust configurations threatens to undermine success.

Is core banking customization a real edge, or just recycled code?

69% of CIOs chase ultra-custom core systems for critical domains, betting on bespoke in-house builds or tweaked vendor solutions. Yet a different approach—rethinking business processes for digital simplicity—might unlock efficiency, without a heavy customization lift.

Agentic AI is the next big bet.

Already 17% of banks are planning 2026 launches, 42% are piloting now—and 55% are targeting smarter data handling and analysis of documentation.



Part one

CEOs steer financial performance through tough terrain

Over the past 15 years, the banking sector has demonstrated broad convergence in financial performance. The dynamics of Return on Average Equity (ROAE) and Cost-to-Income Ratio (CIR) have been constrained by macroeconomic forces, especially for banks in major advanced and EU economies. These forces were shaped by declining interest rates and the demanding regulatory frameworks that emerged in the aftermath of the Global Financial Crisis (GFC).

Furthermore, digital competition has intensified in a sector dominated by declining margins per clients and transactions. Low-rate environments impacted credit pricing, passive investing challenged embedded fees, instant payments put pressure on card rails, and neobanks competed with near-zero prices. Amid these market forces, CEOs had a hard time transforming their institutions at core. They had to simultaneously innovate their business and technology, strengthen their balance sheets, and give risk-taking its due diligence—all while serving clients prudently.

More recently, the rapid rate hikes in 2022—and their lack of synchronization—produced mixed economic outcomes with spiking ROAE but wider dispersion over the last two years, emphasizing macroeconomic and regulatory dominance in shaping banks' profitability. These forces tend to have more influence than internal levers such as investments in technology and AI innovation.

"We operate on the belief that what worked yesterday might not work tomorrow .... With the energy of a startup, we are always ready to try new things, whip up prototypes, and explore what's possible."

Felipe Lamounier, Head of AI Products Strategy, Nubank

The difficulty banks have in extracting above-average returns directly from technology investments is also reflected in average CIR levels, which remain persistently high at long-term post-crisis levels, particularly in major advanced economies. In 2024, across the largest institutions globally, US banks stood at 61.6% on average, EU at 53.6%, and Latin America at 50.4%.[1] This inefficiency is more relevant than ever. While banking CEOs struggle to tackle their stubbornly high CIR, neobanks have showcased the ability to scale effectively with cloud-native, modular core systems. They now achieve remarkable profitability and operational efficiency.

Banks have ebbed in efficiency alongside a broader global decline in productivity rates. As highlighted by recent IBM Institute for Business Value (IBM IBV) research, published in collaboration with Barclays Investment Bank, global productivity rates have decreased since the early 2000s, despite major innovations such as the internet, smartphones, and cloud computing.[2]

The acceleration of AI innovation is a tangible opportunity to improve organizational productivity, also in financial services—provided that CEOs reimagine the way people work and interact with technology. In 2024, banks' workforce costs accounted for between 35% and 65% of total noninterest operating expenses, while technology spanned between 2% and 20% (see Figure 1). Still, linking technology expenditures to financial performance is complex. *The way banks integrate and utilize technology has a greater impact than the total amount spent on technology.*

To effectively drive their institution's economic model requires more than digital lip service from banking CEOs. With AI demanding strategic focus, now is the time for a thorough review of the past decade's investments. It's not an exercise in nostalgia; rather, it can uncover key lessons learned and accelerate success, drawing inspiration from competitors that were more successful in modernizing their systems and capabilities. This calls for an intentional "design for no operations" (NoOps) approach, which enables the business to leverage technology more effectively while minimizing human intervention.

FIGURE 1

10th and 90th percentiles of workforce and technology costs as percentage of total non-interest operating expenses

**ASEAN countries with the exclusion of Singapore. Source: IBM Institute for Business Value analysis of S&P Global data.*

The acceleration of AI innovation is a tangible opportunity to improve organizational productivity—provided that CEOs reimagine the way people work and interact with technology.

Insights from the last decade of tech investments offer valuable lessons to better shape bank spending in the coming years. This IBM IBV study—based on a global survey with over 500 Chief Information Officers (CIO) and almost 200 Chief Data and AI Officers (CDOs and CAIOs) at banks with more than $10 billion of total assets—reveals the critical factors that have held many banks back.

The study also discusses CIOs' learned approaches to improve economic benefits. They suggest that to avoid naive scaling assumptions, banks should demonstrate the value of a deliberate approach to hybrid cloud. They appreciate AI's capability to accelerate IT transformation, improving understanding of application and infrastructure intricacies. They recognize the importance to lead the battle for talent.

What they seem to underestimate is the strategic importance of advanced risk management, which is particularly essential for building trust when scaling AI capabilities across the enterprise. As they prepare to deploy agentic AI for autonomous decision-making, robust risk control and validation are the right first steps to build a competitive advantage.

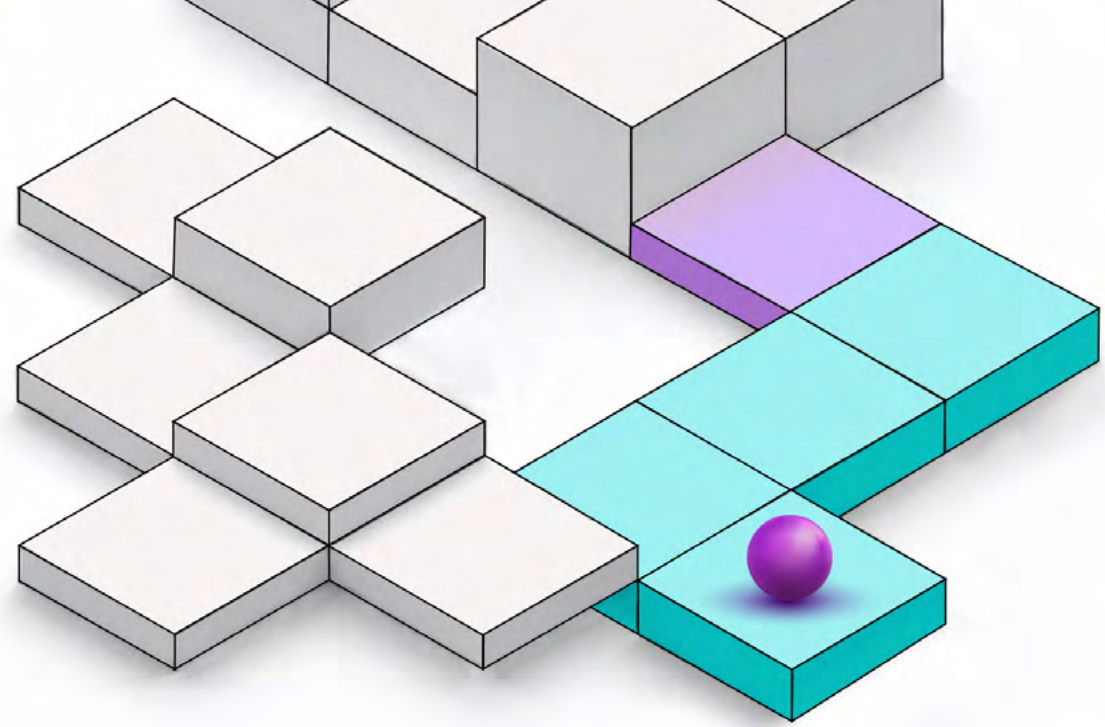
Banks have entered an era in which AI is poised to reshape the way they operate and how clients access their services. The unresolved core banking modernization highlighted in this study is a concerning impediment to banks' ambitions with AI.

Operating on a flexible and modular system, where back- and middle-office layers are efficiently streamlined and front-office investments grant competitive relevance, is not a choice but a necessity to increase the ROI of AI.

This study explores how to make core banking projects successful: CIOs must transcend mere code rewrites—instead reimagining how the bank and its organization operate, how money moves in real time, and how clients are engaged via timely, personalized touchpoints, both directly and beyond traditional banking.

"Today's CIOs must be strategic partners to the business, forging strong relationships across units and leveraging technology as a catalyst for sustainable growth."

Gökhan Gökçay, Executive Vice President, Technology, Akbank



Part two

The CIO's glass is half full

Cloud-native modernization of core banking systems is a key focus of technology investment in the banking sector. This is driven by the urgent need to overcome the limitations of legacy architectures while embracing real-time processing and greater openness through the API economy. For instance, when we asked commercial banking executives about the most coveted technology poised to transform their ability to serve small and medium enterprises, 65% of respondents identified cloud for their critical processes. And 57% advocated for modular and flexible core banking to accelerate time-to-market for new competitive services.[3]

Our research reveals that 75% of banking CIOs consider cloud platforms an integral component of their strategy to run business-critical applications. While 25% have chosen hyperscalers' services as the primary technology, the majority (53%) operate cloud-native applications on modern compting platforms designed for hybrid multi-cloud and AI. These hybrid multi-cloud architectures are intentionally designed to span on-premises, private cloud, and public cloud environments, enabling vertical and horizontal scaling in a distributed computing setup. This fit-for-purpose approach to how banks use infrastructure allows them to achieve a balance between the complexity of workflow orchestration and overall flexibility.

Looking ahead, CIOs' reliance on hyperscaler technology is expected to rise, while key providers fine-tune their commercial strategy in response to demands for cloud sovereignty. A growing number of CIOs expect to host most of their business-critical workloads on hyperscalers' platforms by 2028. The share of banks with more than $500 billion in total assets may rise from 27% to 67%, while for smaller banks, the projected change is from 25% to 41% (see Figure 2).

Interestingly, although most banks forsee higher cloud adoption and are transforming core banking operations with cloud-native approaches, our research reveals that their initiatives have frequently derailed due to three challenges: escalated costs, delayed timelines, and suboptimal outcomes.

FIGURE 2

CIOs indicate the platform where their bank hosts or intends to host most of theirbusiness-critical workloads

** for example, modern computing platforms leveraging the latest mainframe technology designed for hybrid multi-cloud and AI*

"A key lesson we've learned is the escalating challenge of vulnerabilities in the industry—a genuine and urgent problem. To tackle this, we're employing AI to close vulnerabilities more effectively."

Camilo Piedrahita Macias, Senior IT Director Developer Platforms, Bancolombia

First challenge

Costs compound more than expected

More than 50% of CIOs report facing higher costs than expected through their modernization efforts, mainly due to three interconnected challenges (see Figure 3):

Unexpected security considerations (56%). Banks working on cloud often fail to fully recognize nuanced security demands beyond basic infrastructure safeguards.

> For example, while cloud providers handle foundational elements such as data center protection, banks must independently manage aspects such as encryption for sensitive customer data and compliance with data privacy laws. When designing for zero trust, business logic must be embedded in security considerations from the start. Oversights like this often lead to emergency investment in specialized redress tools or audits, inflating budgets as teams scramble to retrofit security measures mid-migration.

Difficulty to resolve critical dependencies while changing the core (53%). Many CIOs point to the inherent complexity of disentangling legacy systems, which are monolithic yet interdependent.

> For instance, altering one core application—such as a transaction processing module—might unexpectedly impact linked systems for account management or reporting, requiring extensive testing, rework, and debugging to resolve hidden dependencies. This not only extends project timelines but also drives up costs through additional developer hours and potential downtime, turning a straightforward migration into a protracted puzzle.

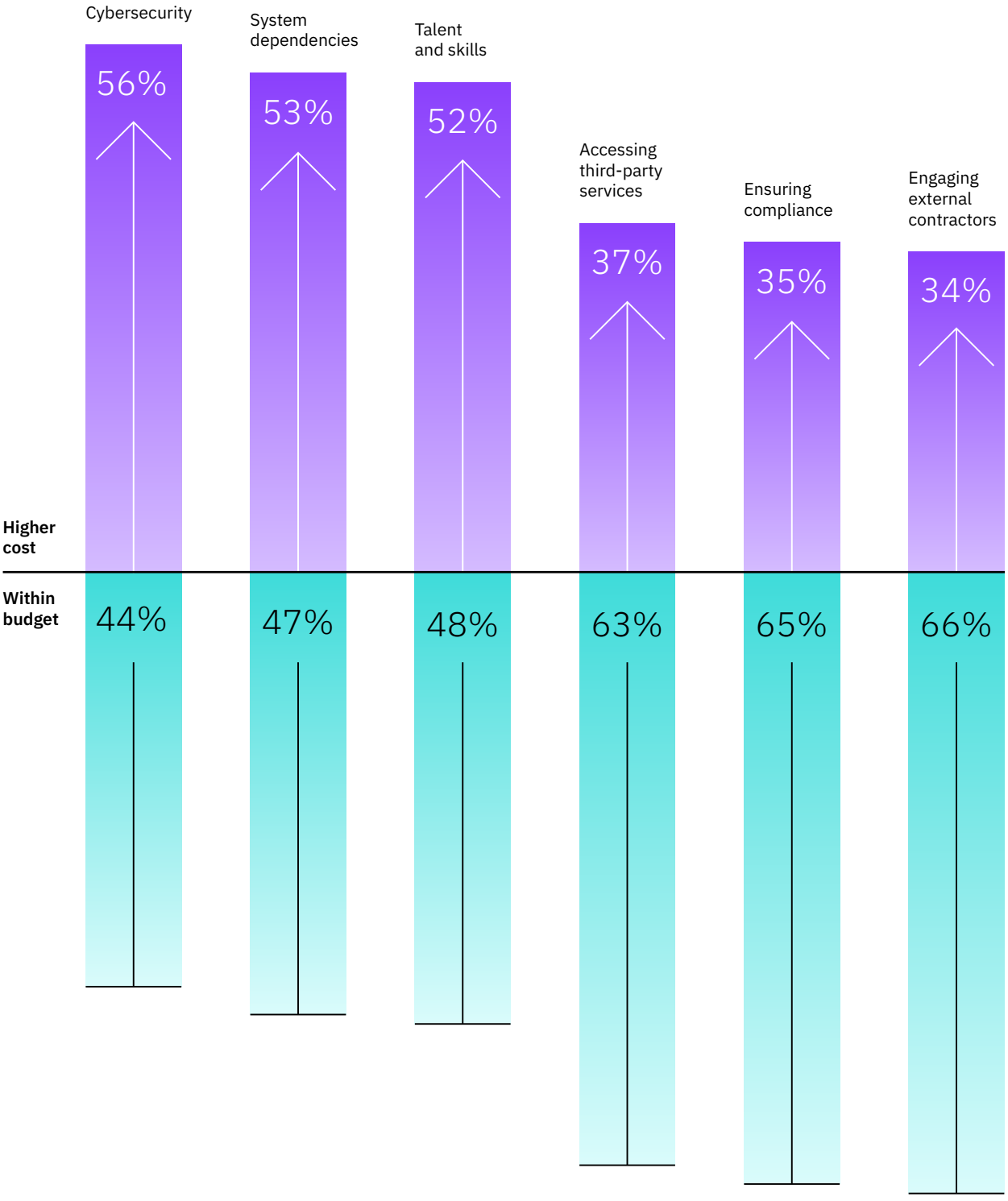
Ensuring the availability of needed cloud expertise (52%). The shift to cloud-native operations requires specialized knowledge in areas such as cloud architecture, automation scripting, and integration best practices—skills that some banks found in shorter supply given lack of extended market experience.

> For example, this talent shortfall can compound other issues, such as inefficient configurations or errors in deployment, ultimately eroding the project's return on investment.

Implementation costs may escalate more than anticipated. Additionally, financing an economic model that fundamentally changes how technical services are consumed could clash with established subscription practices, as vendors' pricing drivers may no longer align with the evolving business landscape. For instance, vendors often charge per transaction. However, transitioning from batch processing to real-time payments alters the nature of these transactions: They become smaller in monetary value and more frequent, leading to new peak periods. As a result, while transaction margins decrease, the associated costs might not decline proportionally.

FIGURE 3

CIOs underestimated cloud migration costs for core banking



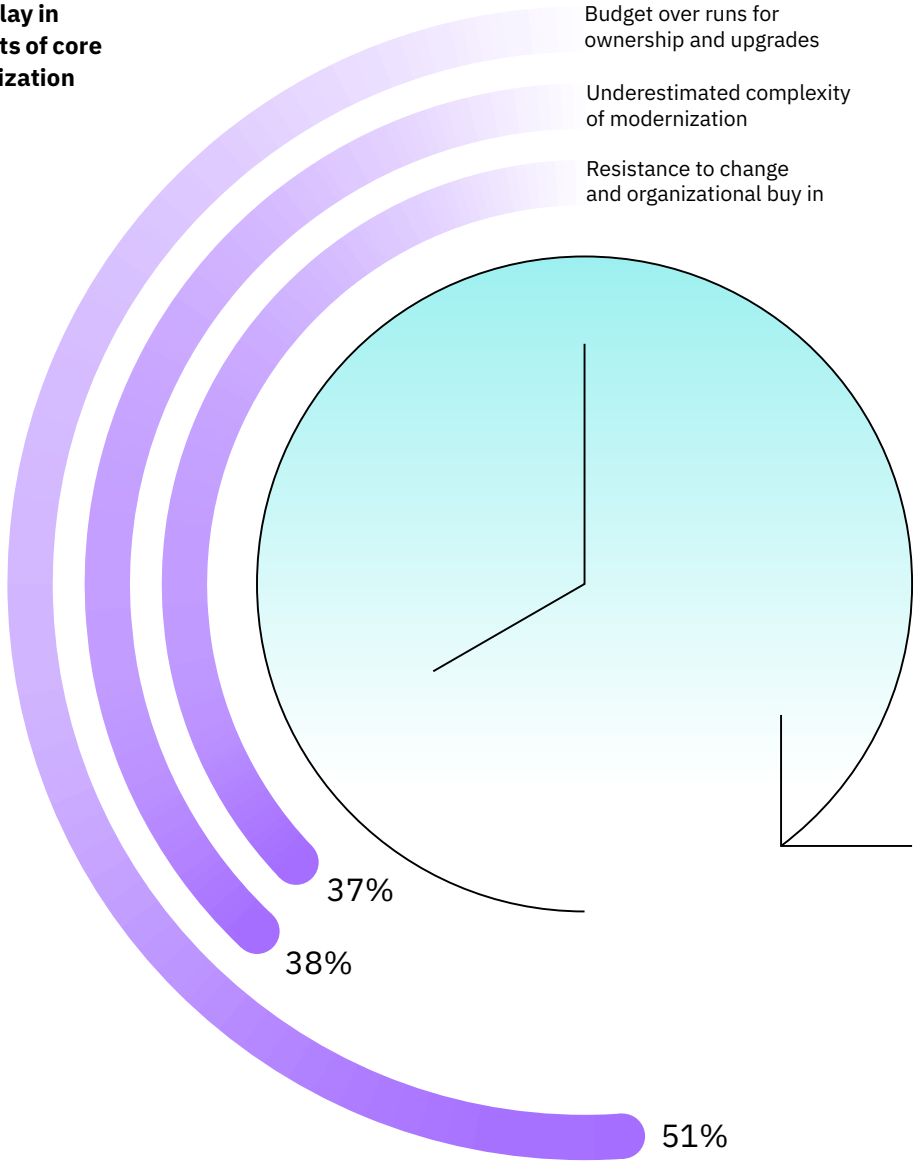
Second challenge

Breaking the modernization bottleneck

The rapidly increasing pace of fintech innovation challenges banks to accelerate the search for operational efficiencies. However, persistent delays in core banking modernization have eroded business value and competitiveness. The primary factors for implementation delays include budget overruns, system complexities, and rigid operating models (see Figure 4).

FIGURE 4

Key causes of delay in multiyear projects of core banking modernization



Delays in critical funding due to higher costs of ownership and upgrade on cloud platforms (51%) led to budget overruns. Many banks experienced ongoing expenses for maintaining and enhancing cloud infrastructures that exceeded initial projections.

> For instance, a bank might encounter unexpected scaling costs during peak transaction periods, resulting in budget overruns that postpone subsequent phases of modernization and force cutbacks in nonessential upgrades. CIOs also report a lack of contractual flexibility, which prevents them from restructuring the cost of ownership when new services are introduced while legacy services remain operational.

Underestimating the complexity of modernization efforts forces frequent revision of tasks and timelines (38%). Banks often underestimated the interdependencies involved in overhauling legacy systems, which led to repeated adjustments in project scope and deadlines to accommodate unforeseen technical hurdles.

> As an example, discovering incompatible legacy code during migration could necessitate multiple iterations of testing and redesign, extending timelines by months and disrupting planned rollouts of new features such as real-time analytics. This issue can only intensify as more experienced workers retire, taking with them their knowledge of the business logic embedded in monolithic code.

Resistance to change operating models inhibits innovative workflows (37%). Teams often hesitate to change how they operate and collaborate, shying away from new tools that might undermine their future with the organization. But breaking through organizational and technical silos is essential for success. Enterprises must be transparent about organizational shifts and technological reconfigurations.

> For instance, a play-it-safe culture may prioritize stability over innovation, as regulatory fears amplify hesitation and delay technology upgrades.

Compounding these challenges is the fact that core banking projects often span multiple years. This extended timeline can lull bankers into a false sense of security, fostering the illusion of ample time to address such matters—yet time inexorably outpaces human deliberation.

More than 60% of banks struggled significantly with system update costs, risk management, and overall platform resilience. For many the road ahead is still uphill.

Third challenge

Burning through billions—for little or no benefits

Beyond mere delays and cost overruns, more than half of CIOs report insufficient overall improvements—despite investing substantial resources. Alarmingly, in some cases, they even suffered a deterioration in operational capabilities (see Figure 5).

On a relatively positive note, close to 50% report significant improvements when being more aggressive in the "front-to-back" modernization efforts, while carefully calibrating their "back-to-front" transformation approach. These improvements are reassuring, indicating that success is challenging but achievable:

Improved client experience (49%). Cloud-native modernization, particularly real-time capabilities, facilitates more dynamic and responsive customer interactions, allowing banks to better meet evolving client expectations without the constraints of rigid legacy systems.

Increased frequency of system updates (46%). The shift enables more agile deployment cycles and time to market for new features, reducing the long downtimes associated with monolithic updates.

More efficient data access (46%). Streamlined data handling, such as quicker retrieval and processing via cloud-native analytics, supports faster decisions in areas such as loan approvals or fraud detection.

In contrast, more than 60% of banks struggled significantly with system update costs, risk management, and overall platform resilience. For many the road ahead is still uphill.

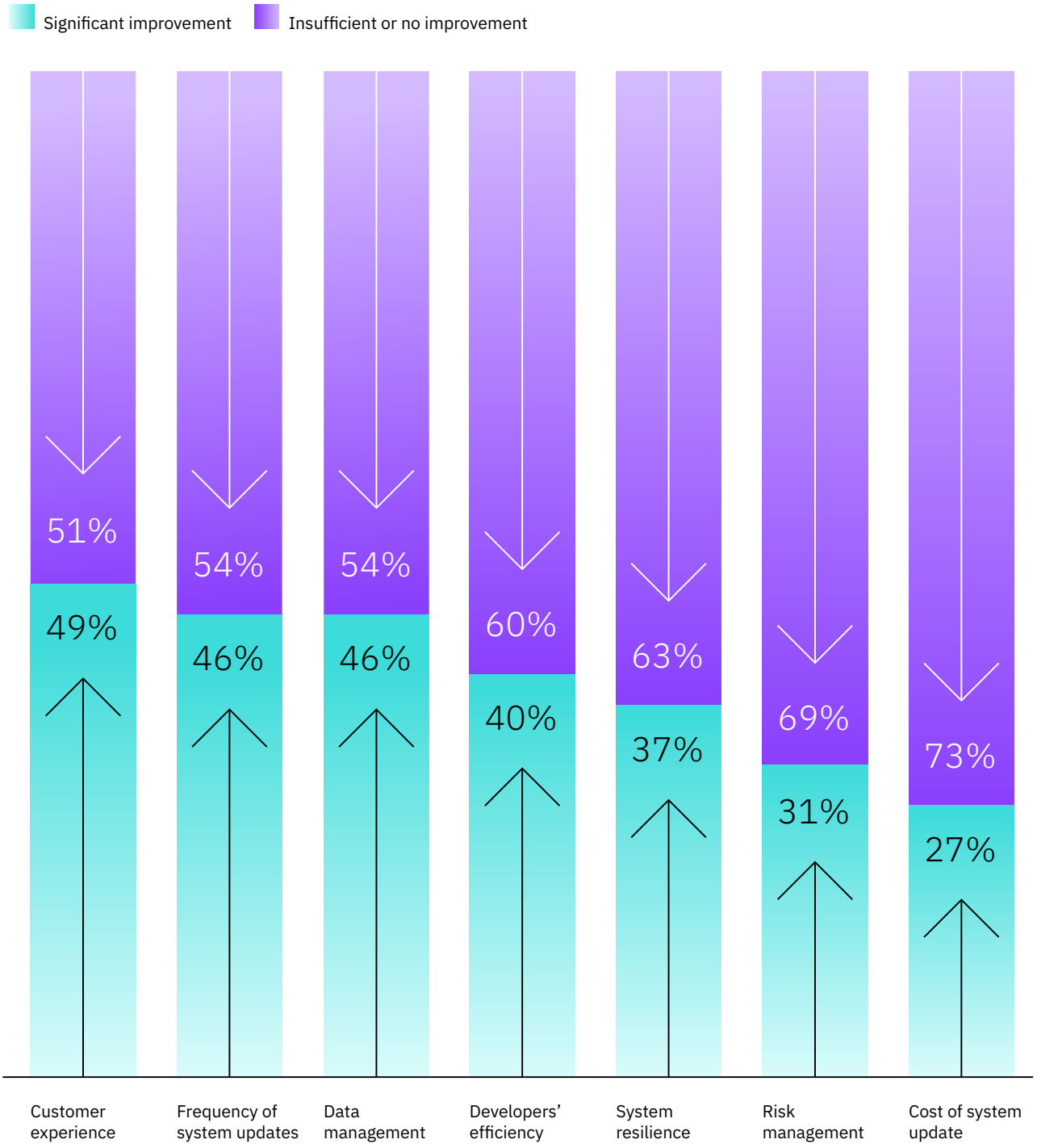
It became harder to manage costs for system updates and modifications (73%). Vendor lock-in and lack of portability exposed many institutions to unexpected strains when pursuing platform upgrades. Furthermore, the cost associated with core banking customization—which bankers request frequently due to regulatory adherence as well as professional preferences—escalates at the time of system updates due to expansive testing requirements.

It became harder to maintain adequate risk management (69%). The cloud environment introduced complexities in adhering to evolving regulatory standards, such as ensuring data sovereignty or audit trails across distributed systems, which resulted in unexpected reviews and adjustments to avoid penalties.

It became harder to guarantee system resilience (63%). Outages in platform availability due to instability of data centers during high-traffic periods, system misconfigurations, security incidents, and improper patch updates occur repeatedly. This mandates a more intentional approach to operational resilience.

FIGURE 5

Not even in one category do the majority of banks report modernization benefits.



Critical lessons materialize that can accelerate success

Notwithstanding the many challenges, we view the glass as half full for CIOs, not half empty, as clear lessons have emerged that can reshuffle existing approaches and expedite the path to success. The analysis of challenges reveals valuable practices, corroborated by what we learned in one-to-one conversations with banking executives, published in the compendium *2025 The voice of the makers.* These emphasize proactive planning and advanced tools to mitigate common pitfalls, fostering more effective transformations (see Figure 6).

Hybrid cloud intentionality pays off. The CIO's top consideration is to diligently embrace design choices, such as assessing upfront platform suitability for high-frequency transactions and governance models, to support fit-for-purpose setups that deliver true scalability and resilience without unexpected complications.

> Intentional hybrid cloud design mitigates overly simplistic industry narratives about the capability of public cloud alone to run extremely high-volume and compliant-rigorous banking transactions.

Industry standards bring business clarity in core banking complexity. The CIO's next lesson is the importance of thorough mapping and analysis to prevent surprises during migrations, as legacy systems often hide layers of intricacy that inflate efforts.

> Applying industry standards brings clarity to the complexities of technology around business domains.

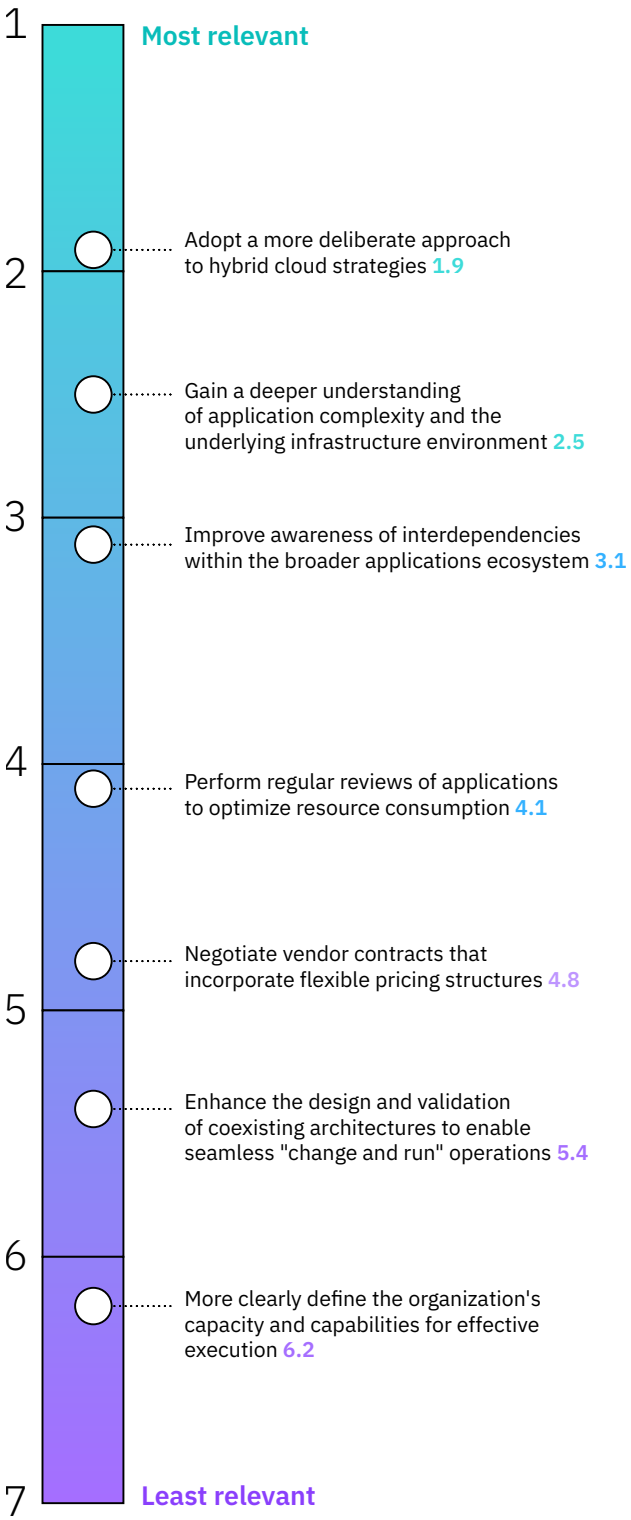
AI addresses the interdependencies across the application ecosystem. The third critical lesson addresses one of the toughest hurdles in banking transformation: Managing interdependencies created from years of unintentional application development devoid of causality. It's particularly relevant given that most banks have opted to both optimize individual components and hollow out services for decoupling from the core.

> Harnessing AI capabilities enables automated discovery, simulation, and optimization of infrastructure elements.

FIGURE 6

Key lessons learned to reduce friction in core banking modernization

Using the Friedman ranking method, we aggregated the top 3 priority selections from all participants to determine the overall ranking of the 7 options. Lower average ranks signify higher priorities, as they reflect more frequent selection and higher placement in individual rankings.



Build an asymmetrical competitive advantage with AI

From these lessons learned, AI emerges with a pivotal role for enhancing the understanding of core applications, thereby fueling modernization efforts. The complexity of existing core banking systems stems not from the type of technology used, but from the monolithic code that embeds business logic directly within the program.

As this evolved over multiple years, banks often lost traceability within the system. Moreover, when experts retire or leave the bank, they frequently take with them a deeper understanding of intricate dependencies, including their existence and underlying logic. While it is advisable to recognize this as the real technical debt, fast-forward to the era of AI. It is the nature of agentic AI to embed business logic within the orchestration layer—and at a more refined level of complexity.

Here, the use of AI becomes an asymmetrical competitive advantage: while every bank will be more competitive using AI, only those that create a unique AI-driven business model can stay well ahead of their peers. When CIOs learn how to leverage generative AI to convert "implicit knowledge" into "explicit knowledge," they can accelerate code translation and creation while retaining information about the logic built into the system.

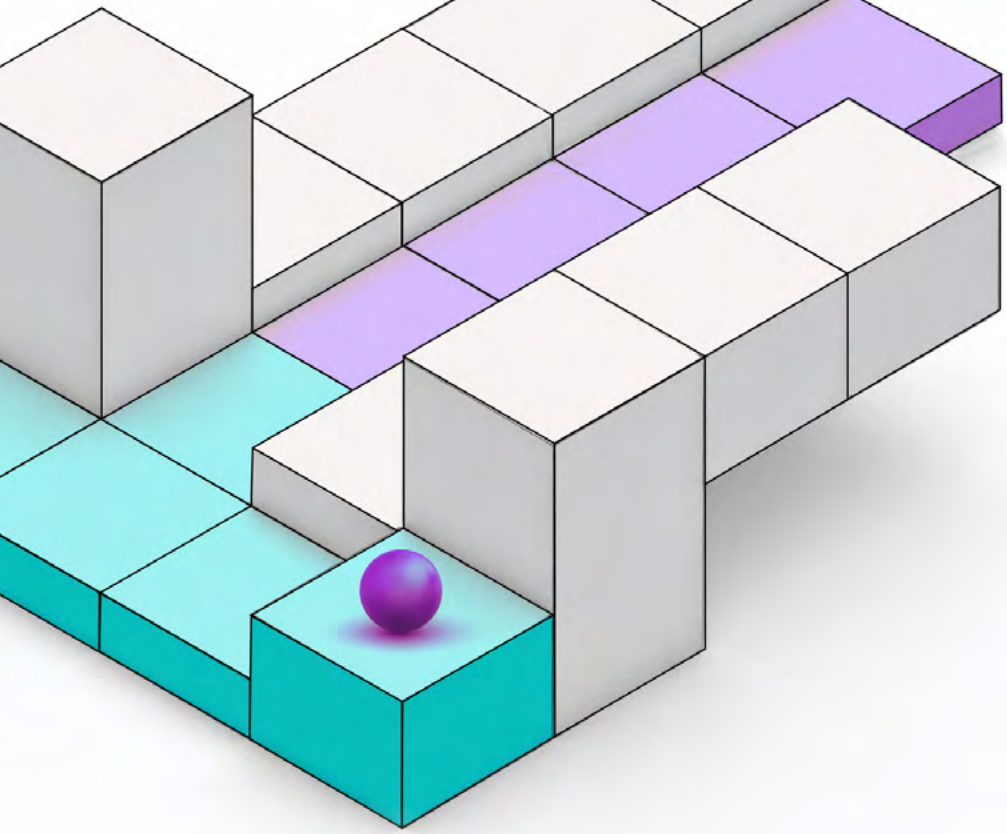
> For example, AI tools can automate the visualization of complex system architectures—helping to identify hidden interconnections and bottlenecks—or generate and refactor code snippets to modernize legacy applications more efficiently, all while maintaining an up-to-date map of all system interdependencies across business domains. Already, more than 50% of banks have started utilizing AI to speed up their IT development processes, and over 90% plan to incorporate it by 2028.

We believe that adopting AI can deliver substantial value to CIOs who seek faster delivery and enhanced business outcomes. However, while the potential is clear, so too are the perils. Consider a scenario where generative AI speeds up the software development lifecycle yet lacks the necessary architectural clarity to fully grasp business domains or the senior development expertise to evaluate the suitability of automated code generation.

Such a scenario could lead to elevated risks in security and resiliency. For instance, in a development environment without a clear understanding of simplification scopes, compounding code might create an exponential surge in complexity. As transformation efforts accelerate, banks must steer clear of an "event horizon"—a metaphorical black hole that swiftly devours any potential for added value. It would be akin to training for a professional diving contest without knowing how to swim.

"At its core, our strategy emphasizes AI's role in software development as vital for our organization's future. We're not just adopting AI—we're leveraging it to create an asymmetric competitive advantage."

Alvaro Ernesto Carmona Ruiz, CTO, Bancolombia



Part three

Strategic modernization extends beyond technology placement

Modular core banking systems are the digital heartbeat of modern financial institutions, powering seamless, real-time transaction processing—from deposits and loans to payments and account updates—while integrating AI for personalized services, fraud detection, and predictive analytics. Unlike monolithic approaches, these cloud-native platforms embrace APIs for effortless ecosystem connectivity, aiming to slash operational costs while boosting scalability, and turning data silos into actionable insights that supercharge customer experiences.

As such, modernizing core banking systems properly extends far beyond merely replacing outdated legacy infrastructure and applications. It requires a deep understanding of business domains (see Perspective, "Embracing the coreless paradigm"). Effective modernization fundamentally alters business-critical operations—shifting them from traditional batch-oriented activities to real-time processing to support new client experiences. Domain-based industry standards offer strategic direction, but only when financial institutions use cross-functional teams with deep business knowledge to deliberately assess outcomes and implications.

A challenge emerges. According to 55% of CIOs, their business-leading counterparts in the organization underestimate the extensive planning needed for effective modernization, often assuming simple plug-and-play solutions exist. Additionally, 31% highlight challenges in communicating modernization complexities in clear business terms. This could be why many such initiatives begin with ambitious objectives but cannot deliver incremental business value—they lack clarity about how to design an effective roadmap that reconciles business needs with technological capabilities.

Perspective

Embracing the coreless paradigm

The coreless model includes a digital front end with unified access controls and coordinated workflows across systems. The back end consists of a simplified fulfillment structure centered on a thin ledger, which handles standard tasks such as transaction recording and basic computations. This core connects with separate modules for managing product details, pricing mechanisms, and operational processes, typically located in the business data layer (BDL) to allow for tailored adjustments with competitive time to market.

Banks can combine various components, such as cloud-based ledgers with on-premises systems for specific areas such as credit cards or mortgages to reduce isolated data and processes. This approach offers banks the chance to enhance responsiveness to market and regulatory changes by selecting specialized tools. It can lower expenses through scalable cloud resources and decreased upkeep of older systems, while allowing focus on unique product elements such as combined offerings, immediate updates, and customized options.

Coreless banking is about the business, not the system. Banks must emphasize aligning with business goals and avoid a one-and-done overhaul approach to core modernization. Begin with targeted pilots in areas needing updates, proceed through gradual expansions, and incorporate data transfer planning from the outset.

Coreless banking is about the business, not the system. Banks must emphasize aligning with business goals and avoid a one-and-done overhaul approach to core modernization.

Taking the first steps

In our survey, we asked CIOs about the starting points for their banks' modernization journeys across 10 business-critical domains: customer onboarding, KYC and AML, fraud detection, payments, lending, deposits, products and pricing, general ledger, treasury and liquidity, and mortgages. More than 40% prioritized areas such as customer onboarding (47%), KYC and AML (44%), fraud detection (42%), and payments (40%) (see Figure 7).

No single initial step is inherently better than another, since unique factors can sway priorities in any given context. This prompted our exploration of the business and technical reasons behind prioritization decisions through analyzing six key criteria:

1. **Business impact**
   Potential for revenue growth
2. **Customer experience**
   Direct improvements in user interactions
3. **Regulatory pressure**
   Compliance mandates
4. **Technical feasibility**
   Ease of implementation given existing tech stacks
5. **Inefficiencies**
   Addressing current bottlenecks or waste
6. **Cost pressure**
   Financial constraints driving the need for efficiency

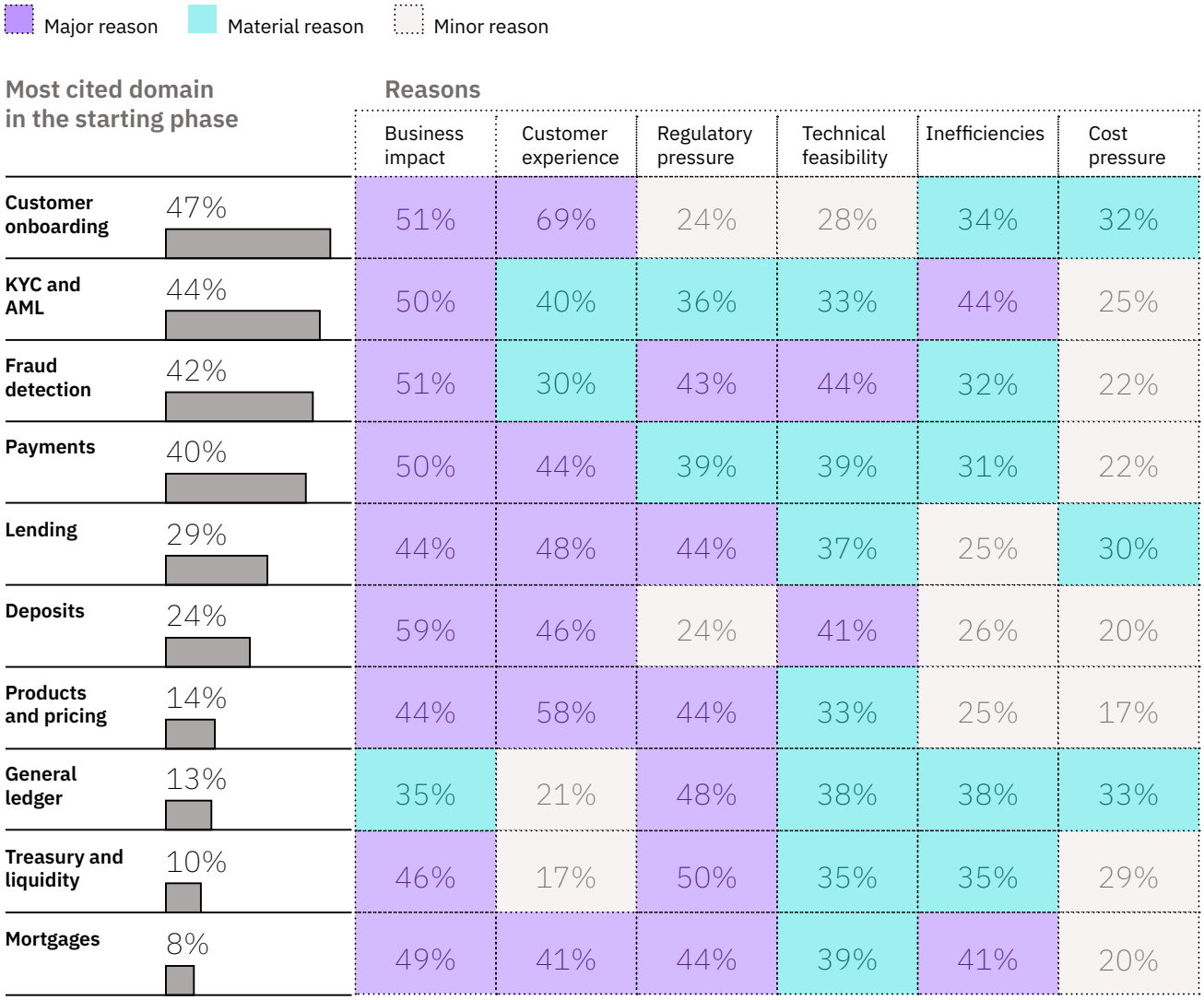
Overall, more than 40% of CIOs cite the pursuit of greater business impact and improved customer experience as prevalent motivators. Regulatory pressure is another key driver, closely followed by technical feasibility and targeted reduction of inefficiencies. Notably, considerations such as cost pressures receive less emphasis (see Figure 7). A more detailed examination reveals interesting nuances among the top four business-critical domains selected as a first step:

Customer onboarding	Enhancing customer experience leads strongly (69%), surpassing business impact (51%) as banks aim to streamline user journeys for faster, more intuitive entry points.
KYC and AML processes	CIOs primarily seek business impact (50%) alongside resolving inefficiencies (44%), focusing on optimizing compliance workflows to cut down on manual errors and delays.
Fraud detection	Prioritization is driven by business impact (51%), technical feasibility (44%), and regulatory pressure (43%), reflecting the need for robust, integrable tools to meet legal standards while minimizing risks in real time.
Payments	Business impact tops the list (50%), followed by customer experience (44%) and regulatory pressure (39%), emphasizing the need to respond to client demands for instant payments and open banking regulatory pressure.

> "We believe that technology and leadership must closely align with strategic priorities such as customer satisfaction, operational excellence, and responsible growth—making tech an integral part of business strategy, not a separate entity."
>
> **Daniel Umberto Ayala Marin,** Leader of IT Excellence Center, Bancolombia

FIGURE 7

Top reasons for prioritization



Most cited domain in the starting phase		Reasons					
		Business impact	Customer experience	Regulatory pressure	Technical feasibility	Inefficiencies	Cost pressure
Customer onboarding	47%	51%	69%	24%	28%	34%	32%
KYC and AML	44%	50%	40%	36%	33%	44%	25%
Fraud detection	42%	51%	30%	43%	44%	32%	22%
Payments	40%	50%	44%	39%	39%	31%	22%
Lending	29%	44%	48%	44%	37%	25%	30%
Deposits	24%	59%	46%	24%	41%	26%	20%
Products and pricing	14%	44%	58%	44%	33%	25%	17%
General ledger	13%	35%	21%	48%	38%	38%	33%
Treasury and liquidity	10%	46%	17%	50%	35%	35%	29%
Mortgages	8%	49%	41%	44%	39%	41%	20%

Banks now face a critical inflection point: transforming isolated AI capabilities into enterprise-wide competitive advantages.

The craftsmanship of core banking modernization

While banks elect to prioritize domains differently, more consensus is found in the approaches applied to modernize their core. In practice, banks lean toward more than optimization, with 69% hollowing out business-critical domains, adopting customizable cloud-native or SaaS solutions.

Optimizing workloads with new tools and capabilities. Advanced technologies, such as AI-driven analytics or automation tools, can be integrated into existing applications without a complete overhaul. For instance, a bank might layer machine learning algorithms onto its transaction processing workload to enable predictive maintenance, reducing downtime and boosting efficiency in high-volume operations.

Hollowing out and decoupling services from the core. Targeted services can be extracted from monolithic core systems and migrated to microservice-based architectures for greater flexibility. An illustration could be decoupling product and pricing from the general ledger system, enabling rapid product launches, dynamic pricing updates, and flexible bundling—without being constrained by core system maintenance and release cycles.

Adopting cloud-native or SaaS services. Select business domains can be replaced by cloud-native solutions or off-the-shelf SaaS products. For instance, a bank might replace its in-house fraud monitoring with a SaaS solution that offers built-in scalability and automatic updates, freeing internal resources for other priorities.

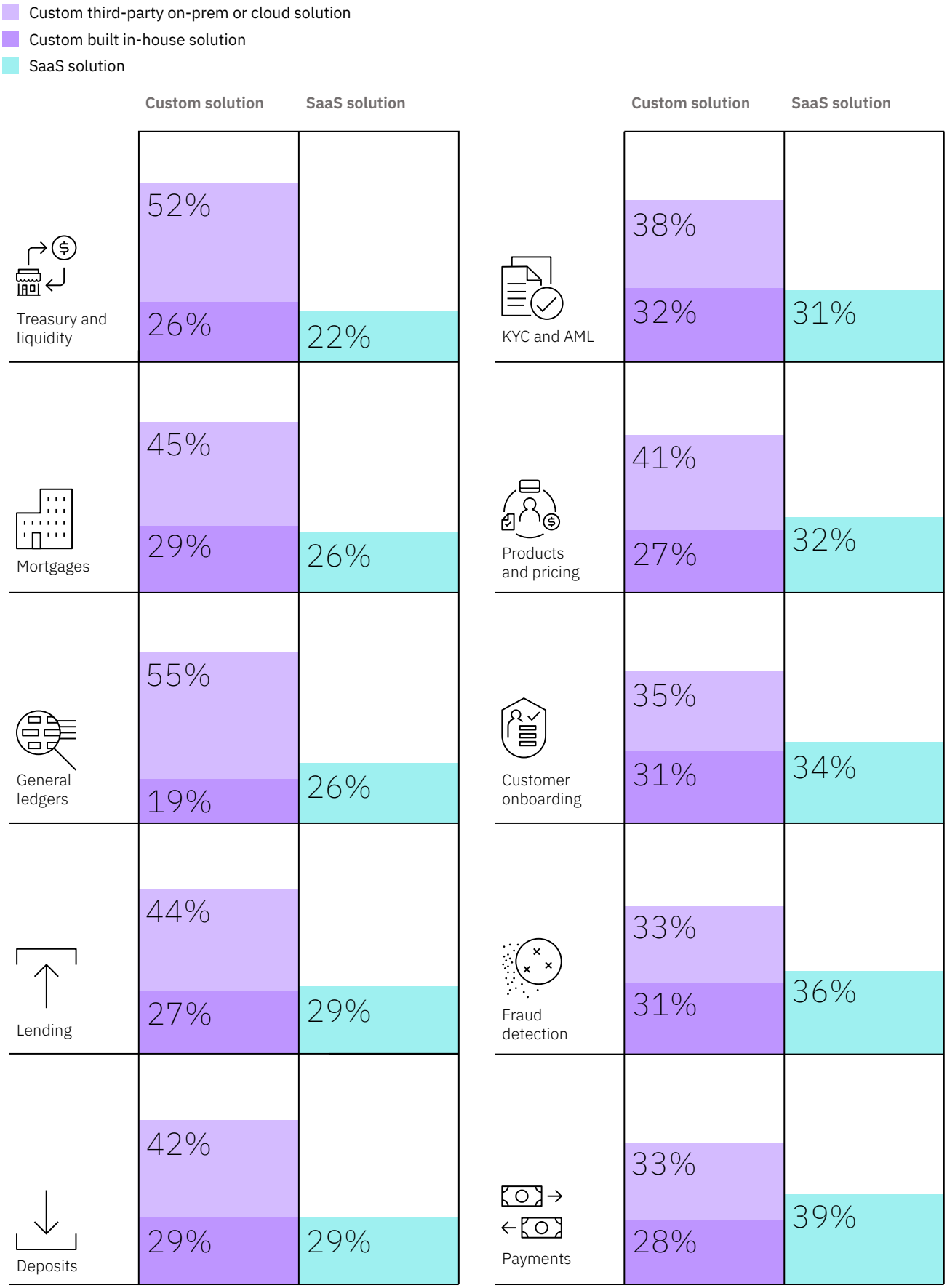
Bankers place high importance on customizable solutions. Looking at the individual domains, fewer than 40% opt for pure SaaS models, though adoption is somewhat higher in specific domains: payments (39%), fraud detection (36%), customer onboarding (34%), products and pricing (32%), and KYC and AML (31%) (see Figure 8).

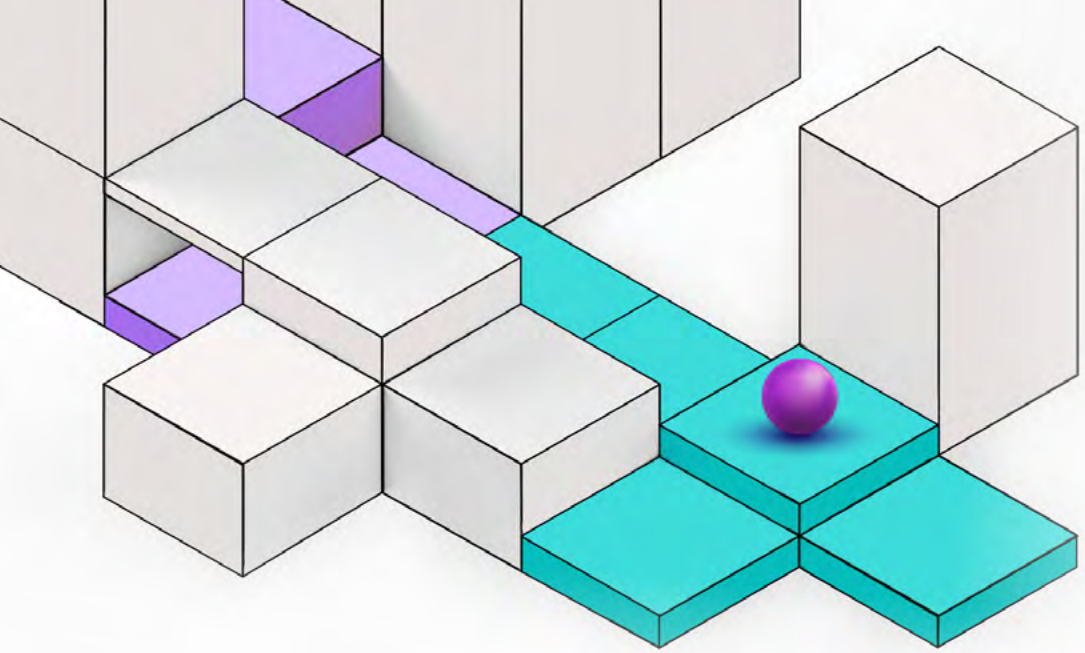
Clearly, regulatory differences across jurisdictions ask for local customization that vendors must also be ready to address. Yet it is debatable whether high levels of customization truly create a deliberate competitive advantage, or if they merely reflect a greater focus on rewriting code rather than fundamentally rethinking the system.

Having established their modernization foundations and gained initial momentum through targeted domain improvements, banks now face a critical inflection point: transforming isolated AI capabilities into enterprise-wide competitive advantages. While early modernization efforts may have introduced AI-powered features in specific areas such as fraud detection or customer onboarding, the real transformation occurs when these dispersed innovations evolve into a cohesive, scalable AI strategy that permeates throughout banking operations. This shift from tactical AI deployment to strategic AI scaling requires a fundamentally different approach—one that leverages the flexible, API-driven infrastructure created during initial modernization to unlock AI's full potential across the entire organization.

FIGURE 8

Core banking customization is evergreen





Part four

Scaling AI enterprise-wide

While many CIOs are still entrenched in core modernization programs, a new wave of technology innovation is poised to reshape banking operations. The relentless pace of AI advancements, driven by generative AI, stresses the urgency to complete core modernization for flexibility and integrability of new capabilities. At the same time, AI can be a valuable ally in accelerating this transformation.

The banking governance of AI

How have CIOs organized their AI governance in this era? Currently, around 40% of banks rely on a centralized model, where a center of excellence manages all activities from strategy development to deployment (see Figure 9). By 2030, CIOs intend to shift toward more distributed approaches to better accommodate rapid innovation and business-specific needs. Approximately 67% of banks may adopt hub-and-spoke or hybrid models, up from 42% today. In these cases, a central hub sets strategy and provides shared resources such as AI platforms and data infrastructure, while spokes adapt these for local use in dedicated business units.

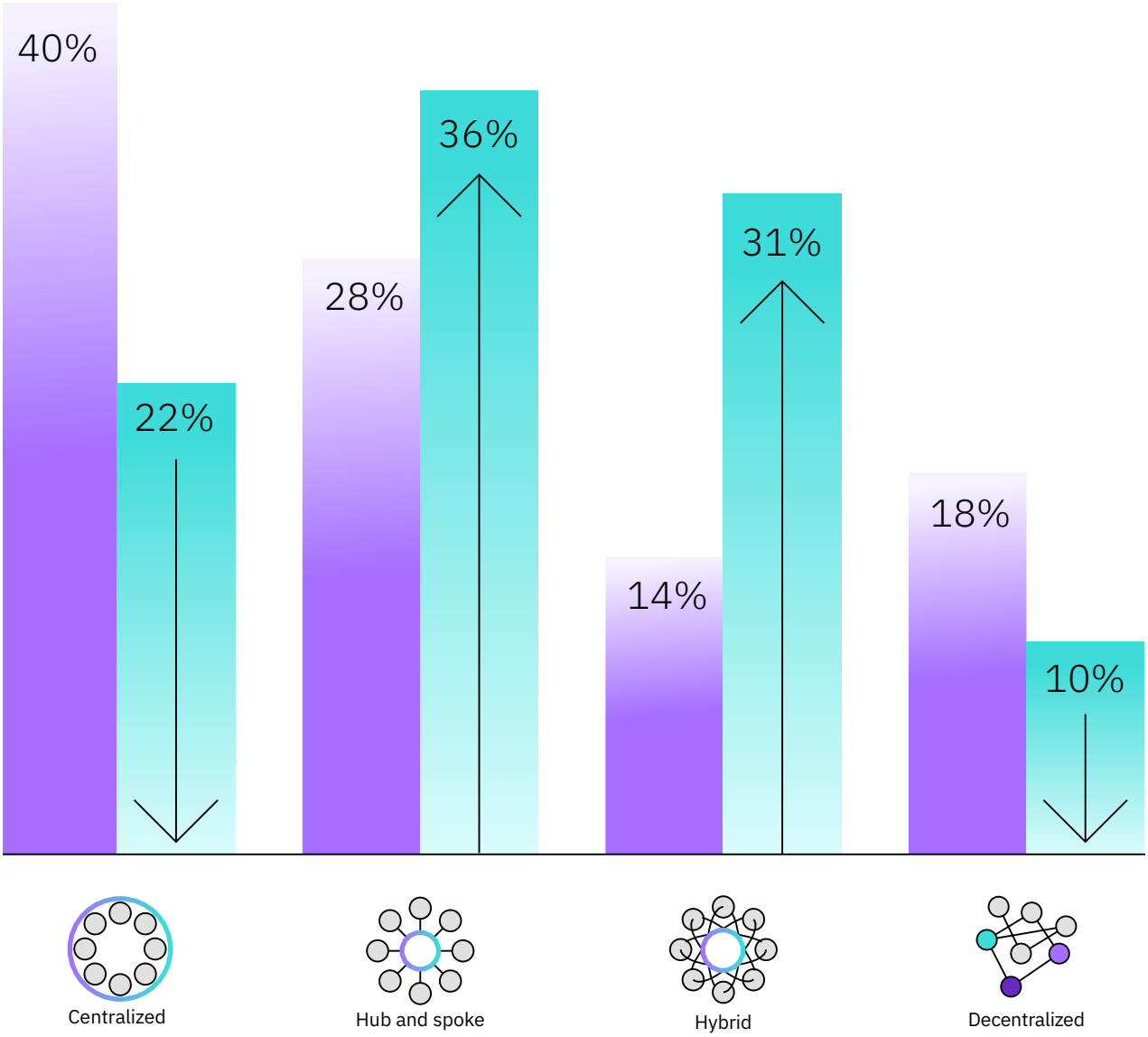
While the prevailing governance model for AI in banking is emerging, the question of who bears primary accountability for AI use case outcomes remains unresolved. Here, 30% of surveyed CIOs, CDOs, and CAIOs indicate business owners, 35% point to either risk controllers or validation officers, and 20% to cross-functional AI committees. This ambiguity spans the AI value chain, from model providers responsible for risk identification and documentation to deployers such as banks tasked with assessments, human oversight, and evaluations. For banks as heavily regulated entities, clarifying accountability is critical for several reasons.

Delineating roles helps manage regulatory compliance amid evolving rules, where failures in oversight could trigger severe penalties. Banks handle sensitive financial data and decisions (for example, loan approvals and fraud detection), so unclear lines of responsibility also heighten risks of noncompliance with privacy laws or anti-discrimination regulations, leading to legal liabilities or reputational harm.

Second, accountability bolsters risk management in a sector where AI errors can cascade into systemic issues, such as biased lending amplifying inequalities or autonomous actions causing financial losses. Without designated accountable parties—such as CIOs for technical gaps or executive levels for ethical oversight—banks risk amplifying emergent threats such as goal misalignment of agentic AI or data privacy breaches, undermining operational resilience and trust. In AI-conscious environments, accountability drives cross-functional collaboration (for example, involving risk teams, data scientists, and compliance officers) to prevent "lawful but awful" scenarios, helping ensure AI enhances productivity without exposing vulnerabilities.

FIGURE 9

AI operating models will shift toward hub-and-spoke or hybrid configurations



"The ultimate goal is to simplify complexity and foster a cohesive ecosystem where AI, platform engineering, and governance integrate seamlessly to drive transformation at scale."

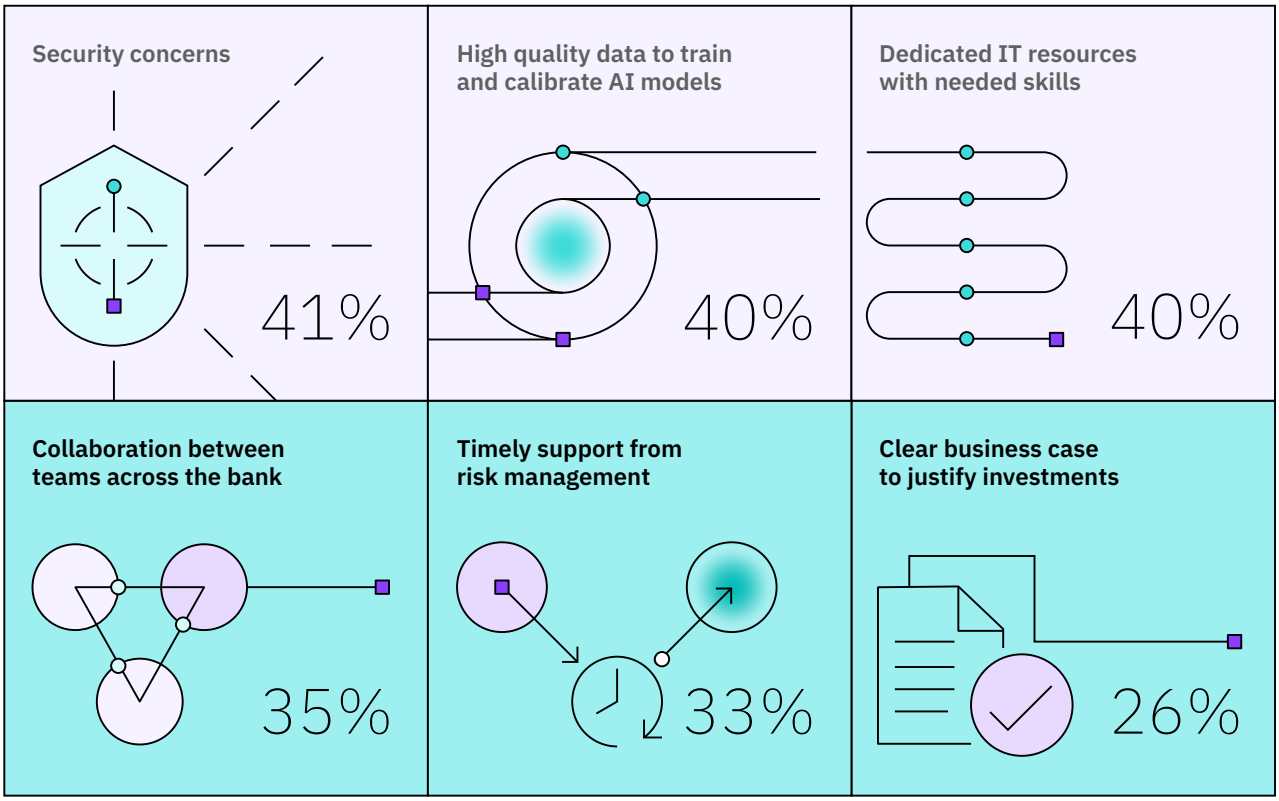
Emanuel Medina Gomez, Leader of IT Engineering Platform, Bancolombia

The survey also revealed that only one-quarter of the executives expressed concerns about justifying the business value of AI adoption. Instead, there is equal consensus on the most pressing challenges: security, lack of high-quality training data, and talent shortages (see Figure 10). For instance, real customer data is often hard to access due to privacy regulations, fragmentation across systems, and bias or gaps in historical records. This is where AI helps, as synthetic data enables realistic datasets that can enable scenario testing without exposing sensitive information. However, synthetic data is not a cure-all, models still require validation on actual transactions to facilitate accuracy and compliance.

Of note: While only 33% of executives indicate a lack of support from risk management as an immediate challenge, we know from our research that risk and validation departments already feel overwhelmed by the impending wave of AI validation and potential control. This will only heighten as banks move from AI pilots to scale enterprise-wide, with many CIOs and CAIOs at risk of being caught off guard. In fact, in a recent survey, 100 risk, compliance, and validation (RCV) officers strongly demanded investment in stress-test simulations (63%) and real-time risk controls (48%).[4]

FIGURE 10

CIOs endorse AI thoughtfully: None of the categories are seen as significant challenges by most CIOs.



"This AI-driven evolution about the way we work and use data spans across the entire enterprise, introducing specific AI risk management requirements calling for a cultural shift. A change in which every employee, from leadership to frontline staff, acts as an AI risk manager."

Caio Banti, Chief Risk Officer Brazil, Nubank

"Before AI can add value, we must ensure the quality, consistency, and reliability of the data we feed it."

Alexandre Oliveria, VP of Risks, Collections, PLD, Fraud and Compliance, Getnet by Santander

This emphasis is particularly relevant as stress-test simulations and real-time risk controls can only be executed on the same platform that supports seamless development, testing, and promotion to production environments. Achieving this requires enhanced collaboration among CIOs, CAIOs, and RCV officers. They must jointly define technical and business requirements, assess talent availability, and coordinate a shared budget to make this symbiosis real.

Unsurprisingly, most CIOs, CAIOs, and CDOs still grapple with the early-stage technical challenges of AI implementation, not yet fully envisioning interactions with risk and compliance functions in a production environment. Reassuringly, when asked how risk and compliance can be success enablers, they indicate the need for faster model validation, stronger governance, and real-time risk controls—factors that can directly help to better design AI platforms for risk proficiency (see Figure 11).

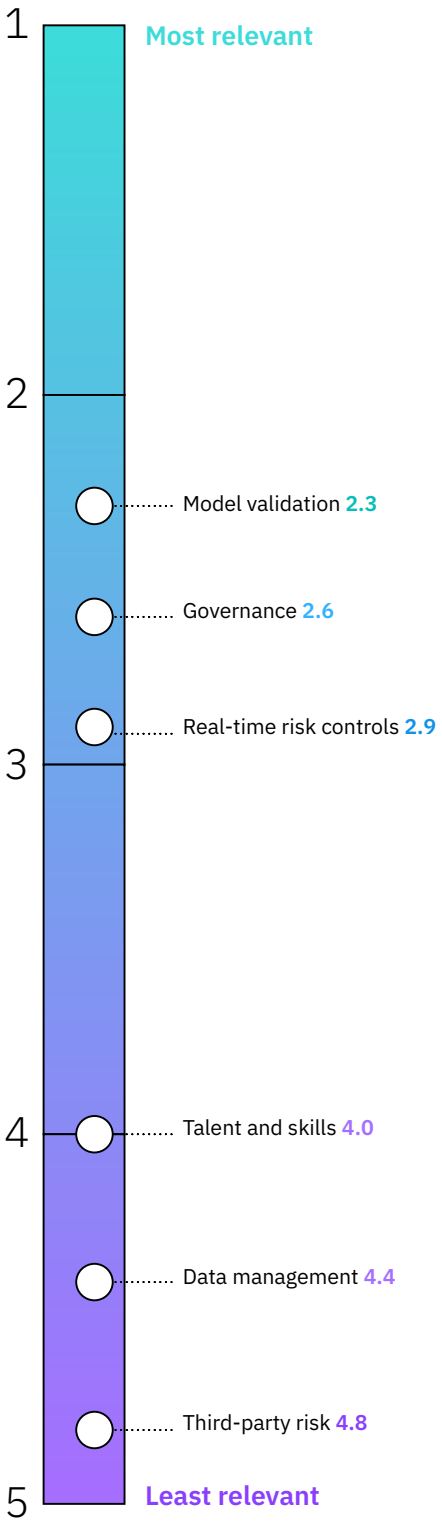
As banks advance toward more sophisticated AI adoption, a clear shift is underway: a focus on integrating cutting-edge capabilities that promise to redefine operational efficiency and strategic advantage. This evolution reflects the growing demand for agility, as AI becomes integral to competitive differentiation, with banks leveraging these models to integrate emerging technologies such as agentic AI for autonomous decision-making.

Clearly, the risk management of AI is foundational to promoting trust in the orchestration of the agentic AI landscape. According to our research, 42% of banks are developing pilots of agentic AI and 17% are already planning to go live in 2026, with a focus on more autonomous handling of data and documentation analysis (55%).

FIGURE 11

Areas in which risk and compliance can enable success, according to CIOs

Using the Friedman ranking method, we aggregated the top 3 priority selections from all participants to determine the overall ranking of the 7 options. Lower average ranks signify higher priorities, as they reflect more frequent selection and higher placement in individual rankings.



"Overall, we must embrace the opportunities AI offers—not just for innovation, but as a powerful form of internal validation. However, with rapid changes come real risks. The key is not to shy away from these risks, but to approach them with intention."

Rita Gnutti, Executive Director, Validation and Controls, Banca Intesa Sanpaolo

Integrating AI: The key to a successful future

Given that financial institutions historically struggle with core banking modernization projects, past experiences offer essential lessons, including the critical role of AI in managing application interdependencies and accelerating transformation. The path to a successful future lies in integrating advanced AI technologies to boost efficiency and gain strategic edges, all while emphasizing ethical practices and regulatory compliance.

By adopting robust risk management frameworks and continuous learning from successes and setbacks, banks can navigate the intricacies of modernization and thrive in the rapidly evolving financial services landscape. This requires transforming the risk management operating model through a more integrated relationship between the first and second lines of defense. Essentially, for risk management to engage in real-time with business activities, banks must redesign ownership and accountability for risk-oriented decisions. These forward-looking practices build trust and convert routine risk reviews into transparent, real-time governance that strengthens the organization.

However, success goes beyond simply using AI to translate legacy code or speed up new development—anyone can adopt those basics. The real competitive advantage comes from building a unified technology framework that enables an AI-driven operating model. This involves harnessing AI to uncover the core banking system's underlying causality, logic, and complexities across code, dependencies, and architectures. In doing so, AI equips CIOs to innovate with full visibility and knowledge-based control. It's a scenario in which AI evolves processes, creating new capabilities that seamlessly align business and technology without generating additional technical debt.

"With agentic AI, the real challenge will be operating models themselves. Organizations are no longer simply deploying software but redesigning how they operate. The AI software may begin to shape workflows, decisions, and even structure. So, while earlier phases were about managing algorithms, ecosystems, or interactions, agentic AI is about transforming the organization through autonomous software."

Stuart Smith, Head of Innovation, Group Retail TMRW, UOB

Action guide

Mastering core banking modernization

01

Don't be busy, be effective: Stay focused on cloud and AI fundamentals. Restart with rigorous planning that avoids simplistic assumptions about economic models for tech innovation and configuration. Step beyond siloed viewpoints by prioritizing incremental core value generation to fuel ongoing victories. Secure a bold mandate for AI as your powerhouse accelerator, unlocking insights into application interdependencies and core banking complexities for effective tech development. Go beyond automation by reshaping workforce interactions and championing AI as the nonnegotiable catalyst for a new IT operating model.

"If you focus solely on efficiency, you risk missing out on new product opportunities. But if you swing too far the other way—prioritizing product innovation without operational discipline—you create long-term inefficiencies that are hard to unwind."

Gordon Little, Executive for payments and platforms, FirstRand Group

02

Unlock people value: Rally around a shared vision and language. Secure buy-in from teams across business and technology, future-proofing operating models to optimize workforce value in a modernized landscape. Inspire morale with a clear vision and leverage industry standards to translate technical roadmaps into business terms—driving open discussions, meticulous planning, and early bottleneck identification. Forge a powerful HR alliance to bridge talent gaps.

"At TD, generative AI is creating a more integrated environment where business and technology teams speak a common language and can collaborate more seamlessly. In that sense, it's not just a tool—it's a shift in how we operate and innovate."

Vipul Lalka, Vice President, Executive Product Owner, Digital Servicing, Canadian Personal Banking, TD Bank Group

03

Target business value: Optimize ROI through strategic tech alignment. Define desired outcomes early, assess technology readiness upfront, and emphasize how business process changes unlock tech's full potential—ensuring every step yields measurable gains. When working with core banking vendors, avoid hyper-customization unless clear business advantages justify it, sidestepping unnecessary complexity and costs.

"Banks need to move past the idea that they are tech-first companies. Instead, they should refocus on being exceptional financial service providers, enabled by technology but not defined by it."

Charbel Safadi, CEO, ZAFIN

04

Drive incremental progress: Avoid one-and-done core banking overhaul. Steer clear of the risky trap of wholesale core system replacements, which breed chaos, high costs, and delays. Opt for phased core banking modernization focused on incremental value creation, delivering measurable outcomes such as cost savings and efficiency gains at each stage to sustain C-level commitment and minimize workforce disruptions.

"Instead of a high-risk 'big bang' migration, we are replacing mainframe capabilities step by step, incorporating modern architectures and application layers. Our core strategy extends beyond mere modernization; it aims to deliver seamless, real-time, and comprehensive digital experiences that align with changing customer behaviors."

Nicolai Rygh, Chief Technology Officer, Retail Bank, DNB

05

Lead on risk management: Enable trusted transformation proactively. Position risk management as an enabler of technology transformation in an accelerated AI lifecycle. Embed risk considerations into your development and production platforms to align innovation with controls. Establish clear accountability in AI governance and mitigate risks strategically.

"'Risk management by design' makes our approach proactive rather than reactive by embedding risk management alongside business development."

Juliana Barby Simão, Global Head of Model Risk Management, Nubank

About the authors

Shanker Ramamurthy

Global Managing Partner,
Banking and Financial Markets
IBM Consulting
linkedin.com/in/shankerramamurthy

Shanker serves as IBM Consulting's Global Managing Partner for Banking and Financial Markets with a particular focus on core banking modernization and payments transformation. He is a member of the IBM Acceleration Team. He is a well-known thought leader with multiple patents, has authored several white papers, and was ranked as one of the 50 most influential financial services consultants worldwide by *Euromoney* magazine.

Andy Baldwin

Global Managing Partner,
Offerings and Growth
IBM Consulting
linkedin.com/in/andybaldwin12

Andy is the Global Managing Partner at IBM Consulting, where he drives global business expansion. He leads the development of market-leading offerings, integrating advanced assets, AI, and industry insights across six global service lines. He oversees the integration of IBM Technology with a broad partner ecosystem into client solutions, while collaborating with geographic units to deploy and activate these innovations for IBM clients worldwide. As a distinguished executive with over 25 years in consulting, he has advised boards on technology, transformation, and regulatory projects. Previously, he served as Global Managing Partner at EY.

Paolo Sironi

Global Research Leader,
Banking and Financial Markets
IBM Institute for Business Value
linkedin.com/in/thepsironi

Paolo is a Global Research Leader in Banking and Financial Markets at the IBM Institute for Business Value. He is a former startup entrepreneur and risk manager in investment banking. Paolo is a respected fintech voice worldwide and hosts the "The Bankers' Bookshelf" podcast on Breaking Banks. He is a recognized author on quant finance, banking, and fintech innovation. His latest bestseller, *Banks and Fintech on Platform Economies,* earned a prominent space in the libraries of curious bankers and fintech entrepreneurs.

Diane Connelly

Global Research Leader,
Banking and Financial Markets
IBM Institute for Business Value
linkedin.com/in/diane-connelly-ibv

Diane is an advisor and marketing strategist to the C-suite, with a strong track record of driving strategic growth and innovation for financial services. With deep expertise in banking, marketing strategy, and technology-driven innovation, she has co-authored numerous influential publications that have shaped executive thinking worldwide. As a Global Research Leader, her insights into market trends and emerging opportunities have helped shape the strategic direction of IBV's Banking and Financial Markets practice, positioning it as a global hub for thought leadership and innovation.

Expert contributors

Hans Tesselaar

Executive Director
BIAN
hans.tesselaar@bian.org
linkedin.com/in/hanstesselaar

Abdullah Khan

Partner and Advisory Practice Leader,
Hybrid Cloud and Data, A/NZ
IBM Consulting
linkedin.com/in/abkhan/

Connor Loessl

Associate Partner, Global Core Banking
and Payments Center
IBM Consulting
linkedin.com/in/connor-loessl-83168851

Jose Pintado

Partner, Global Core Banking
and Payments Center
IBM Consulting
linkedin.com/in/jose-pintado-55b3074/

Geo and client-leading contributors

Marc Haddad

Senior Partner, FSS Leader,
EMEA, IBM Consulting
linkedin.com/in/marcadad

Yuuji Sonku

Managing Partner and Sector Leader,
BKFM, Japan, IBM Consulting
linkedin.com/in/yuji-sonku-b896501ab

Prashant Jajodia

Managing Partner, FS Sector Leader, UKI
IBM Consulting
linkedin.com/in/prashantjajodia

Rashmi Das

Managing Client Partner, US Banking and
Financial Markets Industry Leader
IBM Consulting
linkedin.com/in/rashmidas

Mark Jarvis

Senior Partner, FS Leader,
Canada, IBM Consulting
linkedin.com/in/mark-jarvis-
268884/

Liaquat Parkar

Executive Partner, Banking
IBM Consulting
linkedin.com/in/liaquatparkar

Ria Pinto

Country General Manager
IBM South Africa
riap@za.ibm.com
linkedin.com/in/ria-pinto-1
4784613/

Sergio Fortuna

Managing Director
IBM Technology
linkedin.com/in/sergio-fortuna/

Siri Riis Evensen

Country General Manager
IBM Norway
linkedin.com/in/siri-riis-
evensen-b8a54139/

Marco Utili

Managing Director
IBM Technology
linkedin.com/in/marcoutili/

Mike Jackson

VP Managing Director
IBM Technology
linkedin.com/in/mike-jackson-
1a64a91/

Juan Francisco Herrera

Lead Client Partner
IBM Consulting
linkedin.com/in/jfherrera/

Isil Kilinc Gurtuna

Country General Manager
IBM Türkiye
linkedin.com/in/isilkilincgurtuna/

Monique Filardi Louza Vieira

Global Sales Leader
IBM Technology
linkedin.com/in/monique-filardi-
louza-vieira-a478a937/

Research methodology

The IBM Institute for Business Value conducted a global survey in Q2 2025 to capture lessons learned from core banking modernization, cloud migration, and the use of AI in banking organizations. The questionnaire explored modernization strategies for business-critical components, computing platform transitions, cost management, adoption challenges, talent allocation, AI governance, and emerging technologies such as agentic AI.

Geographies	Count	Columns %
North America	153	22%
Europe	143	20%
Japan	104	15%
APAC	59	8%
Greater China	192	27%
LATAM	17	2%
MEA	32	5%
Sample size	**700**	**100%**

Sample and fieldwork

The survey targeted 700 senior technology executives — including Chief Information Officers (CIOs), Chief Data Officers (CDOs), and Chief AI Officers (CAIOs) from banking institutions with total assets exceeding USD$10 billion. Respondents were required to have group-level responsibility and be directly involved in, or knowledgeable about, at least one of the following initiatives: adoption of cloud practices, modernization of core banking systems, or innovation with data and AI.

Analytical approach

The IBV research team applied a combination of descriptive and advanced statistical techniques to uncover trends, prioritize strategic factors, and identify statistically significant differences across segments. Descriptive statistics were used to summarize distributions by geography, institutional size, modernization stage, and technology strategy. For ranked-priority questions such as cost-control measures and AI governance needs, Friedman rank analysis was employed to test for statistically significant differences in the importance assigned to various options, an approach well-suited for ordinal, repeated-measures data. Percentile analysis was applied to examine the distribution of IT talent by location and employment type, in order to assess the spread, median, and upper and lower quartiles of resource allocation patterns for 2025 and 2028. TURF (Total Unduplicated Reach and Frequency) analysis was conducted for selected multiple-response questions to determine the combinations of options that maximized overall audience reach. Finally, pairwise tests were used to compare differences across groups — such as by total asset tier, role, or country— to identify statistically significant variations ($p < 0.05$) in modernization strategies, cost-control priorities, and AI adoption patterns.

These analyses confirmed that the observed differences were unlikely to be due to chance, reflecting consistent and measurable variations in strategic priorities across the banking sector.

About Research Insights

Research Insights are fact-based strategic insights for business executives on critical public- and private-sector issues. They are based on findings from analysis of our own primary research studies. For more information, contact the IBM Institute for Business Value at iibv@us.ibm.com

IBM Institute for Business Value

For two decades, the IBM Institute for Business Value has served as the thought leadership think tank for IBM. What inspires us is producing research-backed, technology-informed strategic insights that help leaders make smarter business decisions.

From our unique position at the intersection of business, technology, and society, we survey, interview, and engage with thousands of executives, consumers, and experts each year, synthesizing their perspectives into credible, inspiring, and actionable insights.

To stay connected and informed, sign up to receive IBV's email newsletter at ibm.com/ibv. You can also find us on LinkedIn at https://ibm.co/ibv-linkedin.

The right partner for a changing world

At IBM, we collaborate with our clients, bringing together business insight, advanced research, and technology to give them a distinct advantage in today's rapidly changing environment.

Related reports

2025 Global Outlook for Banking and Financial Markets—Elevate financial performance in the age of AI

IBM Institute for Business Value. February 2025. https://ibm.co/2025-banking-financial-markets-outlook

Banking in the AI era—The risk management of AI and with AI

IBM Institute for Business Value. June 2025. https://ibm.co/banking-in-ai-era

State of the Industry—Banking and Financial Markets

IBM Institute for Business Value. May 2025. https://www.ibm.com/thought-leadership/institute-business-value/en-us/report/banking-financial-markets-state-of-industry

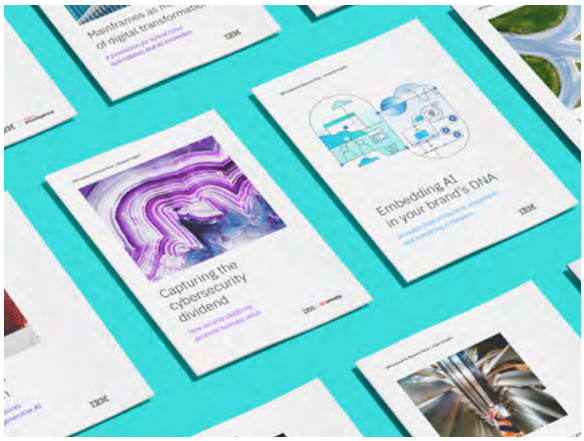
Notes and sources

1 Ramamurthy, Shanker and Paolo Sironi. *2025 Global Outlook for Banking and Financial Markets: Elevate banking performance in the age of AI.* IBM Institute for Business Value. January 26, 2025. https://ibm.co/2025-banking-financial-markets-outlook

2 *AI revolution: Productivity boom and beyond.* Impact series. Barclays and IBM. 2024. https://www.ib.barclays/our-insights/AI-productivity-boom.html

3 Ramamurthy, Shanker, John J. Duigenan, Hans Tesselaar, and Paolo Sironi. *Banking for small and medium enterprises: Serving the world economy with data and AI.* IBM Institute for Business Value in partnership with BIAN. September 11, 2024. https://ibm.co/sme-banking

4 Ramamurthy, Shanker and Paolo Sironi. *Banking in the AI era: The risk management of AI and with AI.* IBM Institute for Business Value. June 23, 2025. https://ibm.co/banking-in-ai-era



IBM Corporation
New Orchard Road
Armonk, NY 10504

Produced in the United States of America | September 2025

1443d5c7d4c02290-USEN-03