BEETHOVEN, SCHUBERT, AND BANK TECHNOLOGY MODERNIZATION

By Rash Gandhi, Timothy Mandefield, and Evan Stubbs

BEETHOVEN'S FIFTH SYMPHONY OFFERS the perfect musical backdrop for today's banking industry. The composer characterized the opening notes as "fate knocking on the door," a fitting description of how banking executives may feel when facing the daunting prospect of an accelerating digital transformation and the need to modernize core systems.

Banks can tackle the challenge in one of two ways. They can choose what we call the Beethovian approach and, in an analogy to the composer's bold statements, "go big" out of the gate. This entails a fast-paced transformation with large investments intended to implement a fully modern technology stack. But such a dramatic approach carries huge upfront costs and significant operational risks. Instead, we favor what we call the Schubertian approach, which is equally ambitious in its aspirations but more subdued in style, more poised in rhythm, and less frightening to the performer.

The Schubertian approach entails carefully defining data-driven use cases and rolling out new digital services at frequent intervals to create many moments of incremental progress that cumulatively become transformative. A bank's IT modernization becomes a long-term endeavor, a continuous transformation rather than a program with a set end date. Fundamental to this approach is the implementation of a flexible data and digital platform (DDP)—a technology infrastructure architecture that separates data from core transactional systems.

Framing the Journey

The banking industry is at an inflection point and faces a host of technical and competitive issues: the challenge of running the bank on lower interest margins; aging, inflexible infrastructure that makes data access and innovation slow and difficult; managing technical debt as experienced staff near retirement; new competitors unencumbered by legacy systems; and customer demands for an experience similar to what they receive from purely digital

firms. IT costs represent about 20% of operating costs and are expected to rise as banks increasingly provide digital products and services.

These circumstances are no secret, of course, and banks generally understand what they need: a modular architecture, scalable data platforms to access data through standardized APIs for multiple purposes, and a shift toward "cloud native" systems to support more resilient, asset-light operating models. BCG estimates that modernization costs at large incumbent banks over the next three to five years will typically represent up to 50% of their annual "change the bank" budget. The question is not so much what a bank's technology landscape should look like but how to frame the journey without stalling business development for three years or more.

The Three Movements of the Transformation

With the Schubertian/DDP approach, banks can follow three steps in a pragmatic transformation. This will allow them to pace their modernization journey by taking calculated risks, prioritizing initiatives, and setting realistic milestones. It also lessens friction within the operating model, delivers incremental business outcomes, and helps the bank's culture adjust to new ways of working.

The benefits of DDP-enabled initiatives are often visible in a matter of months and can often fund themselves. For example, a European bank leveraged a modern data platform for its mobile-banking app in a low-cost and flexible way, relieving pressure (and costs) on core mainframe systems.

1. Articulate the vision and define the target state. Think of this exercise as locating the bank's North Star. The purpose is to clearly articulate the target state for the new architecture and thus ensure consistency in decision making. For example, a private bank we worked with framed its journey as the creation of a modern, Amazon-like customer experience. It aimed

to improve client satisfaction, lower costs, boost productivity, and expand revenue by digitizing and optimizing processes across sales and servicing, which included creating a number of self-service customer journeys.

But defining the target state does not mean defining the exact path to get there. That kind of rigidity would be self-defeating. The bank needs the agility to cope with unforeseen challenges (and opportunities) and make corrections along the way. To put this agility into practice, banks need a flexible, streamlined IT architecture with a data platform at the core; modular, scalable, and reusable digital enablers for all new customer journeys; modern storage and processing infrastructure for all data; a 360-degree customer view; and data services available through APIs.

The DDP approach delivers agility by creating a data layer that liberates data from core systems, which are scattered across the bank. (See Exhibit 1.) With a DDP, technology stacks have simple interfaces, data moves faster and becomes a new source of competitive advantage, and agile teams can work in new, more collaborative ways. Digital front ends are more adaptable and can evolve with new customer, supplier, and employee needs. Banks can leverage external best-in-class technology without relinquishing control of the data or locking it into a monolithic solution.

Banks are thus able to resist the temptation to rebuild everything. Yes, the infrastructure is aging and modernization is necessary. But there is still enormous value within the enterprise, and it's vital to identify existing assets that are a source of competitive advantage. A granular analysis, conducted at the functional level, can identify such assets, which may include the following:

- **Data.** Client data as well as records of customer transactions spanning many years remain core to a bank's competitive advantage (even if locked away in siloed systems). The point is to put the tools and infrastructure in place to

Smart-business layer
Omnichannel tooling to meet customers' rising expectations with regard to experience and personalization, underpinned by smart-decision engines (e.g., for next-best action)

Data layer
One integrated data layer, including all core components

Business analytics and prediction for data-driven decision making

Core layer
Hybrid environments with best-of-breed SaaS providers and legacy components

Integration layer with process automation through RPA/AA/AI real-time integration

- Omnichannel experience with smooth customer journey
- Smart-decision engines

- Operations data and analytics, RPA/AI
- Data layer

- Core layer
- Infrastructure/cloud

Internal and external APIs

Cyber and data protection

Partner ecosystem

Internal and external APIs
Defined APIs and API layers for internal data access and external data exchange

Cyber and data protection
Protect assets with a defense-in-depth approach

Quickly recognize and react to internal and external attacks

Infrastructure layer
Use of public cloud providers for scale and cost effects, as well as internal/external private clouds with focus on service level and automation

Source: BCG analysis.

liberate and use this data as quickly as possible.

- **Systems.** Across the banking value chain there are systems that are still fit for purpose and don't need to be rebuilt (for example, standard features for credit processing). And some systems—such as payments engines—have proven quite sturdy in handling huge transaction volumes and spikes. Additionally, some systems unique to financial institutions are not easily rebuilt, such as those for managing regulatory reporting and assets and liabilities.

At this point, banks can identify which systems to retain, retire, re-platform, and re-architect. These assessments should be completed in weeks rather than months and be conducted jointly with business and IT teams so they can align on priorities and tradeoffs. The goal is not to work out every detail but to quickly establish a heat map of the bank's current IT architecture so that, in the next phase, initiatives can be prioritized and sequenced for implementation.

For example, when the private bank we worked with assessed the client technology

and data landscape and mapped it to the DDP reference model, it identified major process, technology, and data pain points across the IT architecture. These included highly manual processes and fragmented client and staff journeys; inaccurate and inconsistent data availability across channels due to batch-based data integration; siloed data across multiple core systems; and no single source of high-quality master data regarding clients and their product holdings.

2. Bring the vision to life with incremental digital initiatives. To avoid being overwhelmed by the task at hand, banks should break it down into smaller, more manageable initiatives that create value and maintain momentum for continued improvement. Based on the priorities established by the business and IT during the assessment, the bank can define specific modernization initiatives targeting process-, technology-, and data-related improvements—and then sequence these initiatives to optimize improvements over time. (See the sidebar, "Building a Highly Personalized Customer Experience.")

Banks should prioritize digital initiatives that can serve multiple use cases, making sure that each one fits into the overall

# BUILDING A HIGHLY PERSONALIZED CUSTOMER EXPERIENCE

We worked with a bank that wanted to drive growth in customer acquisitions and deposits, as well as increase products per customer while avoiding any expansion of its branch footprint. To that end, it implemented a DDP to unlock data and support a more highly personalized strategy encompassing products, offers, channels, messages, and timing. While the personalization strategy was the bank's immediate goal, the initiative also served its broader agenda of liberating data from siloes, making data available for multiple uses, and decoupling new developments from legacy systems.

The bank faced significant challenges in creating a personalized, best-in-class digital experience. These included a largely nondigital IT landscape based on point-to-point connections; assets and liabilities businesses with overlapping IT systems (core banking, CRM, marketing, data) and many duplicated "traditional"

IT capabilities; calendar-based (as opposed to personalized) marketing with minimal digital-marketing support; and a fragmented digital experience with multiple apps and websites.

To overcome these challenges, the bank began by defining the target state for the enterprise architecture and creating a roadmap that involved simplifying and consolidating the architecture. (See the exhibit below.) To navigate this roadmap, the bank embedded new ways of working within its IT function, such as DevOps, agile, and CI/CD. It was then able to begin the hard work of building a new best-in-class digital layer with an engine to deliver hyperpersonalized experiences at scale.

A New Architecture to Personalize the Customer Experience
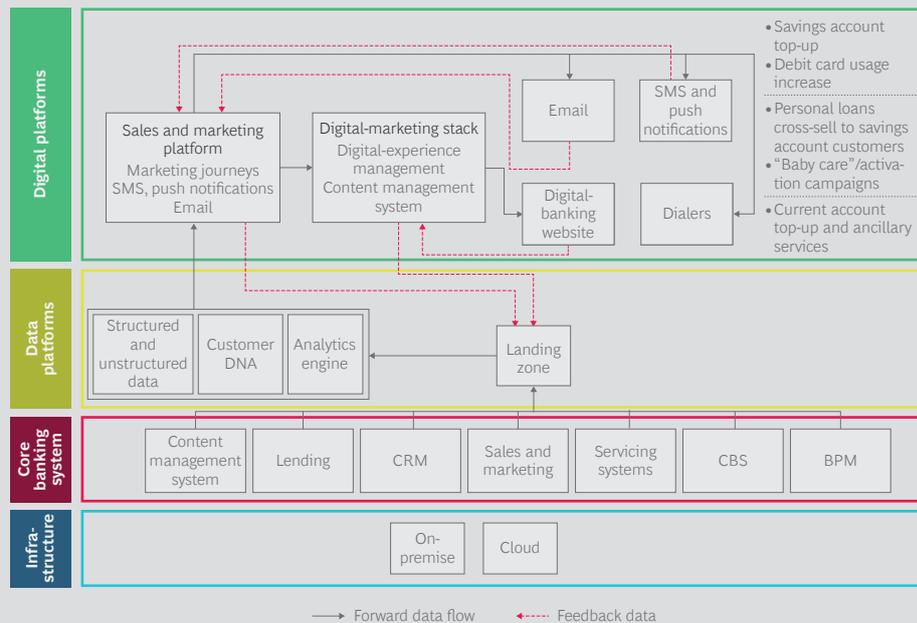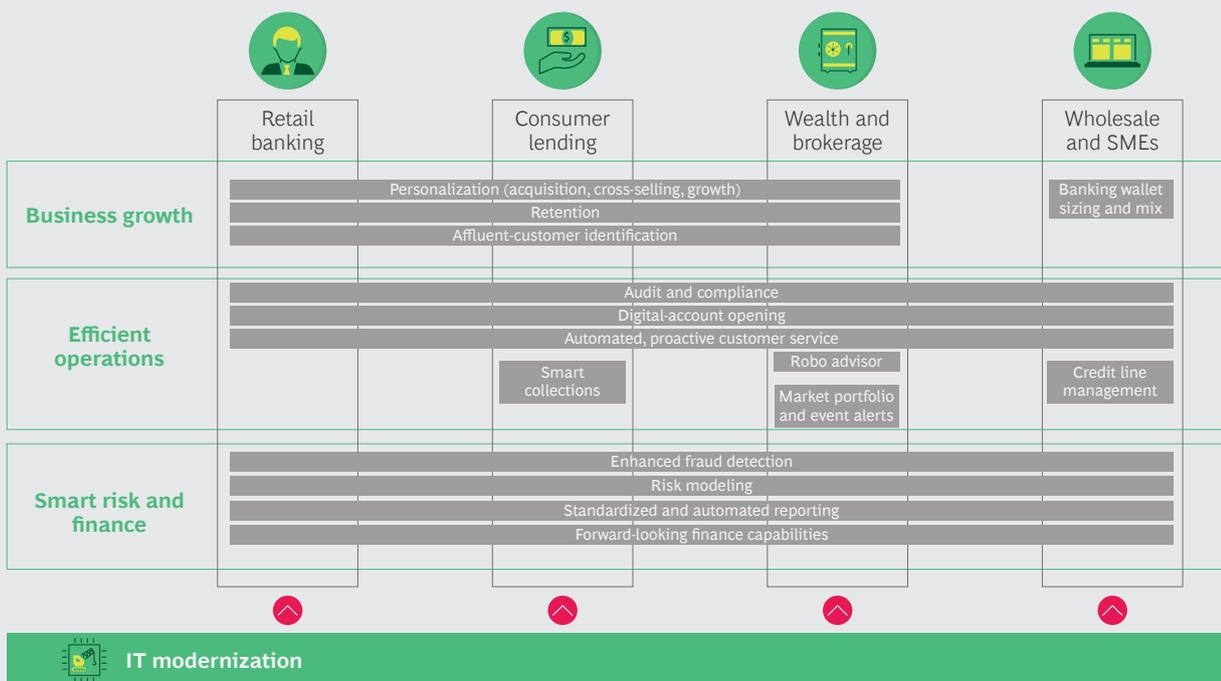

Source: BCG analysis.

framework. (See Exhibit 2.) For example, by mapping the technology and data necessary for its priority use cases, the private bank we worked with was able to sequence the major IT components required (taking special note of those necessary for multiple use cases). This sequencing also allowed the bank to identify key technology gaps and pinpoint where IT upgrades would have the most immediate and beneficial effects—all within the context of the digital architecture's target state.

To accelerate the implementation of these use cases, banks need to follow one of the fundamental tenets of the DDP approach, which is to make an effort to liberate data from core systems and make it easily available. To that end, financial institutions are increasingly building distributed domain-oriented data teams with end-to-end ownership and responsibility for building, running, and cataloguing domain-specific data assets and publishing APIs to these services for other teams to find and consume as they build new services.

3. Continually look for opportunities to modernize core systems. The DDP-based approach helps banks decouple their data and digital initiatives from core system modernization. But that does not mean banks should stop modernizing the core. While there is almost always a bias toward the exciting, customer-facing technologies over more behind-the-scenes, nuts-and-bolts work, companies need to strike the right balance and opportunistically pursue both project types. If a customer-facing initiative costs 5% to 10% more to also solve the underlying IT pain point, it is money well spent. Examples include going the extra mile to fully decommission legacy systems when new systems go live, stripping functionalities from the mainframe systems to reduce their scope, and exposing services through standardized APIs.

Strong governance is needed to ensure that these opportunities are spotted and acted upon. That can include a mechanism for grading how much a project could contribute to IT modernization, including negative

EXHIBIT 2 | Potential Use Cases to Drive the IT Journey

	Retail banking	Consumer lending	Wealth and brokerage	Wholesale and SMEs
Business growth	Personalization (acquisition, cross-selling, growth)			Banking wallet sizing and mix
	Retention			
	Affluent-customer identification			
Efficient operations	Audit and compliance			
	Digital-account opening			
	Automated, proactive customer service			
			Robo advisor	
		Smart collections	Market portfolio and event alerts	Credit line management
Smart risk and finance	Enhanced fraud detection			
	Risk modeling			
	Standardized and automated reporting			
	Forward-looking finance capabilities			
IT modernization				

Source: BCG analysis.

scores if it adds to technical debt. Banks should also foster a dialogue between business and IT teams on various tradeoffs, such as time to market versus reusability, total cost of ownership, and future agility. IT budget discussions should focus not just on IT modernization but also on IT value and the ability to provide business value in the future.

For example, the private bank we worked with has specific targets to further the company's ongoing digital transformation. These include building a data layer with high-quality client master data for digital journeys and use cases and building a smart-business layer to drive process automation, self-service journeys, and client collaboration.

BY FOLLOWING THE Schubertian approach, banks can pace their modernization journey, taking calculated risks and prioritizing initiatives with realistic milestones based on close collaboration between business and IT. Rather than demand big go/no-go decisions about how much to invest in IT modernization, DDP offers a rigorous and flexible way to manage available resources for long-term business value. The total IT budget becomes just one input when considering overall financials and strategic intent. This context is critical to maintaining the commitment and momentum for the bank's digital transformation.

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