WHITE PAPER

# Core Banking System (CBS) Modernization:

## A Critical Imperative For Southeast Asian Banks - Part I

**June 2025**
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Boston Consulting Group partners with leaders in business and society to tackle their most important challenges and capture their greatest opportunities. BCG was the pioneer in business strategy when it was founded in 1963. Today, we work closely with clients to embrace a transformational approach aimed at benefiting all stakeholders—empowering organizations to grow, build sustainable competitive advantage, and drive positive societal impact.

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This paper is the first in a two-part series exploring the core banking modernization imperative for banks in Southeast Asia. It addresses ‘why’ CBS modernization is both a business and technology priority. The subsequent paper will delve into the 'how' of CBS modernization, providing insights into strategies that can increase chances of successful implementation.

Southeast Asia represents a fast-changing banking landscape. With the expansion of digital solutions and a demographically young population, consumer demand across the ecosystem is growing rapidly. **Customer expectations are rising,** driven by the clamor for hyper-personalized and on-demand services. **Fintechs and neobanks are intensifying the competition** by offering seamless digital experiences.

Banks are forced to **explore new revenue opportunities** through open banking and embedded finance, necessitating integration with third-party ecosystems at scale. **Data-driven operations** are becoming essential for improving efficiency, detecting anomalies, and generating predictive insights. Adopting **emerging technologies** like cloud-native architecture, microservices, and artificial intelligence (AI)/machine learning (ML) provide an opportunity to address the need for agility and scalability.

At the same time, banks are under pressure to **improve cost efficiency** amidst rising operational and technology costs. **Regulatory demands for resiliency** have become more stringent. And finally, **employee expectations** for modern, intuitive tools are real, as banks compete for top talent.

This is placing significant strain on the underlying banking systems. Especially **the legacy core banking systems (CBS)—which were built for an earlier era** and came with a different DNA than characterized by the needs of today. Legacy CBS are focused on **batch processing and static workflows,** making them ill-equipped to meet modern demands. They **lack the flexibility, scalability, and integration capabilities** needed for today’s fast-paced, digital-first environment. These systems also pose **challenges in data accessibility, real-time processing, and compliance**, leading to inefficiencies, higher costs, and missed opportunities.

To thrive in this evolving landscape, Southeast Asian banks need to modernize their CBS. Modern CBS platforms enable agility, scalability, and resilience, empowering banks to deliver exceptional customer experiences, unlock new growth opportunities, and stay competitive in a rapidly changing financial ecosystem. Modernization is no longer an option—it is a strategic, business and technical necessity.

## What are Core Banking Systems?

CBS are vital for effective banking operations. These platforms are mission-critical systems that enable key functions such as deposit booking and lending operations, alongside a range of other essential tasks. Hence, fit-for-purpose CBS are a must-have for any bank to ensure that customer-critical operations are carried out successfully.

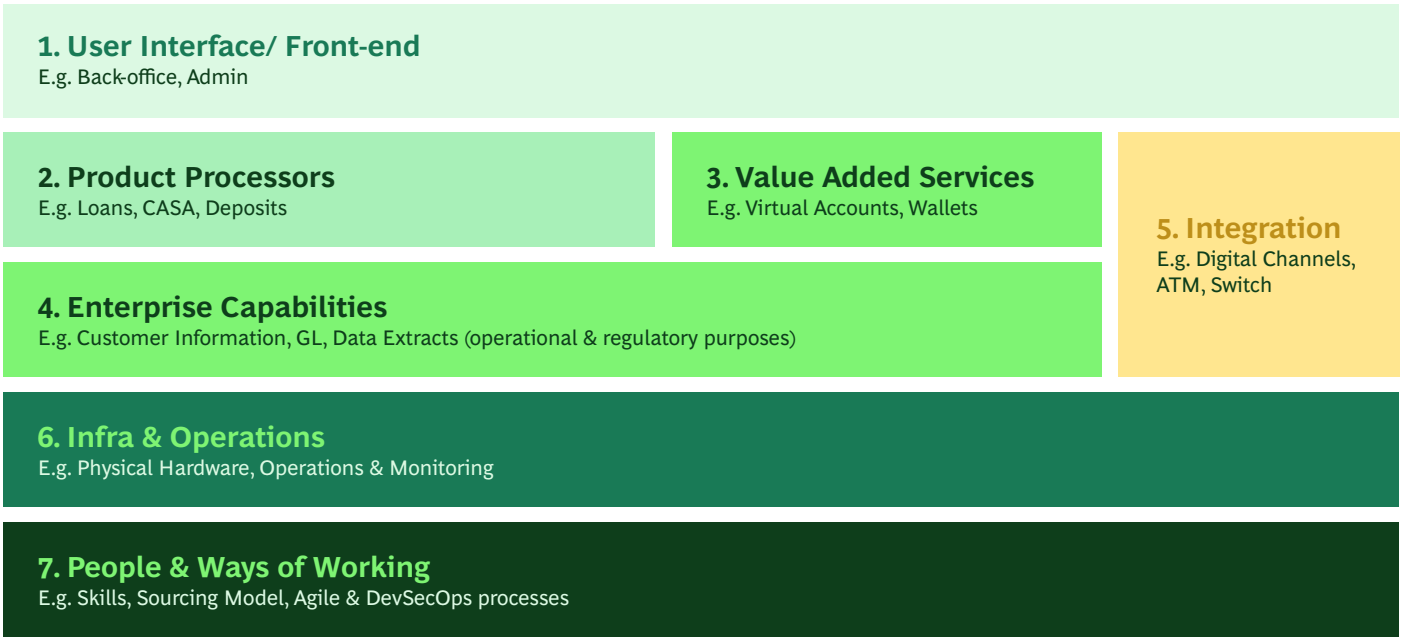
A core banking platform enables banks to undertake execution of daily customer interactions as well as providing the foundation of good record keeping. An appropriate analogy for CBS is that they represent the central nervous system of a bank, supporting all fundamental operations that keep the bank healthy and running.

Given the importance of CBS, it is crucial to understand the central elements that make up an effective and end-to-end system. Broadly speaking, we can map CBS capabilities across seven major areas. [Exhibit 1.]

- **UI/Front End.** Provide user interface (UI) to service customer requests, fulfil transactions, and administer the system. For example, providing interface for operations teams.
- **Product processors.** Provide product manufacturing and servicing of lifecycle events. For example, deposits and loans for retail and corporate customers.
- **Value Added Services.** Support additional offerings beyond the core products. For example, virtual accounts for corporates, digital wallets for consumers.
- **Enterprise Capabilities.** Facilitate key business capabilities across all customer segments. For example, general ledger, data preparation for regulatory and operational reporting.
- **Integration.** Mechanisms to facilitate integration with other bank applications, channels or external third-party systems. For example, connections to digital channels, payment gateways.
- **Infrastructure and operations.** Provide underlying platform and observability to meet changing business demand efficiently, with resilience, reliability and security. For example, handling transaction volume peaks on salary days.
- **People and ways of working.** Ensuring the right team and operating model for optimal operations and timely servicing of changes. For example, business and technology co-owning a prioritized list of changes.

**EXHIBIT 1**

## Core Banking Systems (CBS) – Capability Map

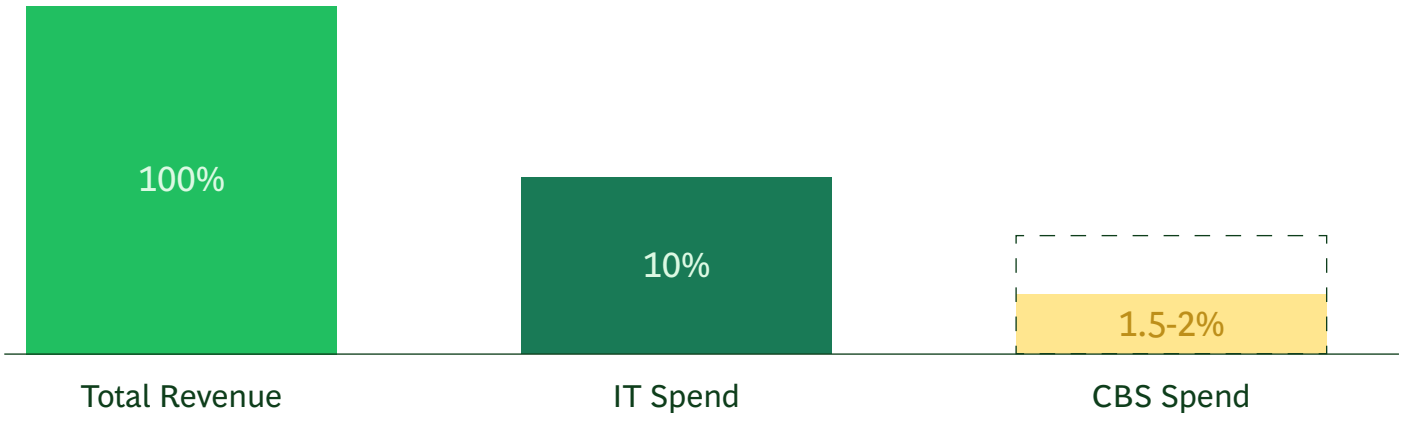



**Source:** BCG Analysis.

Given the extended coverage and criticality of CBS, we estimate banks spend anywhere between 15% to 20% of total information technology (IT) spend on upkeep and changes to these core systems. This can be north of hundred million dollars a year for a large tier 1 bank. [Exhibit 2.]

**EXHIBIT 2**

## Average Annual CBS Spend




**Source:** BCG Analysis.

## The state of CBS in Southeast Asia

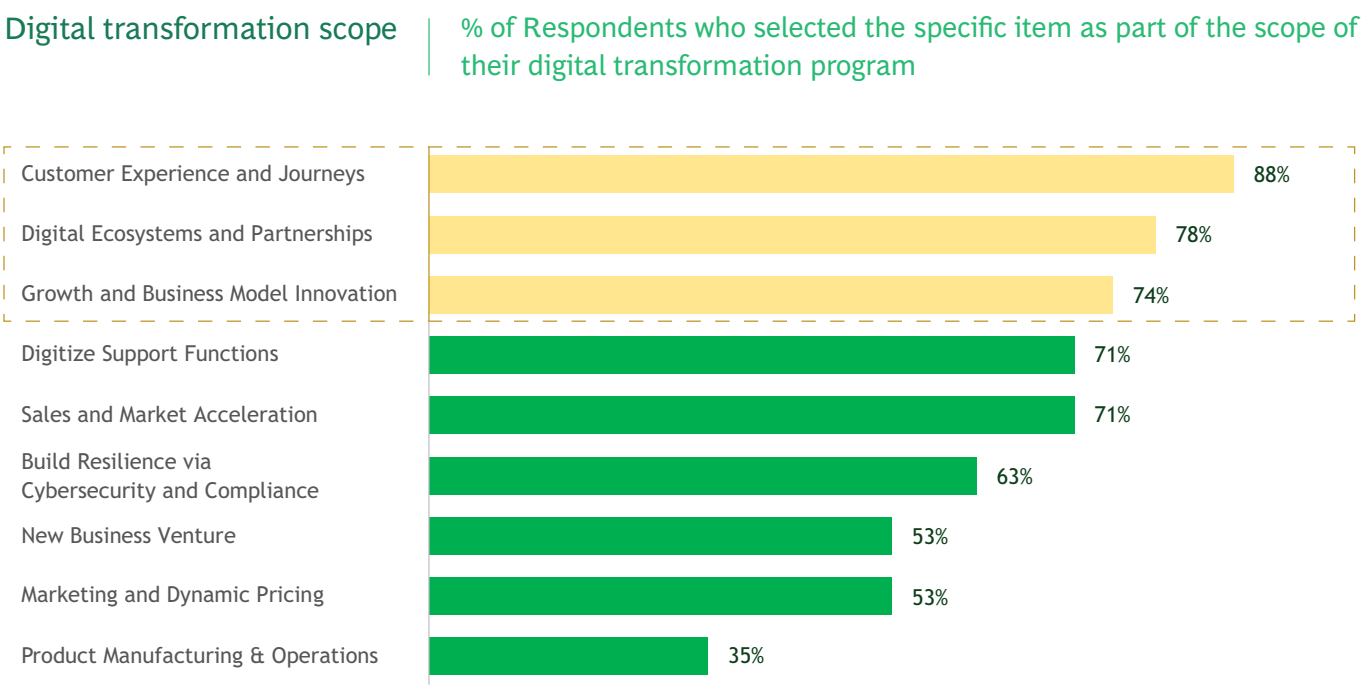
In the last decade, despite significant spend on CBS, they do not typically form a part of the large digital and customer-centric transformations undertaken by most incumbent banks in Southeast Asia. This runs the risk of CBS not being able to match the demands of the changing banking needs.

In this period, across the region, banking transformation spend has typically focused on front-end channels such as mobile and internet banking, as well as customer relationship management (CRM) systems. [Exhibit 3.]

In a survey on digital transformation priorities for banking, almost nine out of ten respondents highlighted customer experience and journeys as the top priority, with digital ecosystems, partnerships, growth and business model innovation following closely behind.

**EXHIBIT 3**

### Top Priorities of Digital Transformation by Incumbent Banks




**Source:** BCG Global Digital Transformation Survey 2021, n=80

Most Southeast Asian banks have been maintaining the status quo when it comes to their CBS platform. If we look at the profile of CBS across leading banks in Southeast Asia, it is clear that that the majority of incumbent banks are running on older technologies—primarily mainframe based—deployed on-premises. [Exhibit 4.]

In fact, the average age of CBS in Southeast Asian banks is estimated to be 20 years or more. This is representative of a gap of at least two generations in the evolution of the platform from (1) mainframe-based platforms, followed by (2) enterprise solutions typically hosted on enterprise UNIX/Windows servers and relational databases (RDBMS), and now on to (3) cloud-ready, and (4) cloud-native technology stacks.

**EXHIBIT 4**

Core Banking Technology of Incumbent Southeast Asian Banks

## Digital Core

| Mainframe | X86 | Cloud Ready /Optimized | Cloud Native |
|---|---|---|---|
| **90-95%** Large majority of banks, including most of the market leaders across developed and emerging markets in SEA | | **3-5%** Handful of Tier 1 banks across the region | **1-2%** Primarily digital banks, building ground-up e.g. Trust Bank |

**Source:** BCG Analysis.

## Why are banks hesitant to change CBS?

Despite the state of ageing CBS, banks have historically been hesitant to undertake modernization efforts. The default approach for Southeast Asian banks has been to implement incremental changes to meet evolving business or regulatory needs, and customize out-of-the-box functionality as and when needed.

The result of this approach is that, over time, banks have developed a highly customized platform that is a complex sum of many parts. This complex platform—alongside loss of key resources in IT and business teams and limited CBS-specific learning resources or literature—turns the CBS system into a 'Frankenstein's Monster' of cobbled together functions and capabilities. As a result, it is difficult to find people in the organization who fully understand the existing CBS platform or have the confidence and know-how to change it.

The complexity of these 'evolved-over-time' CBS translates into a significantly high risk to CBS modernization programs. The most prominent of these risks have played out clearly in CBS modernization programs across a variety of banks in recent times. The are four core risks: (1) opportunity cost, (2) time and cost overruns, (3) write-offs and impairments that cast doubt on management's ability to execute complex programs, ultimately leading to (4) management exits. [Exhibit 5.]

**EXHIBIT 5**

## Common Reasons Banks Avoid Core Banking Transformations

| Key Risks | Examples |
|---|---|
| **Opportunity**<br>Lower ROI, at times negative purely on tech basis leading to delays in undertaking CBS modernization | Most banks prioritize digital and channel-related initiatives directly impacting customer experience and revenues over core banking modernization to address end-to-end needs. |
| **Time & Cost Overrun**<br>Significant delays and cost increase versus plan (several times or multi-fold) | One European national bank targeted a program to revamp their core systems in 4.5 years with an initial budget outlay of €500M. This ended up extending by over two years with costs increasing 4X |
| **Write-offs & Impairments**<br>Partial or full write down of the investments made | A global bank ended up writing off over US$1.4 billion of investments after five years due to a failed program to implement a common core banking system across markets. |
| **Management Exits**<br>Leadership/CXO exits attributed to failed core banking endeavors | The exit by the CEO of a UK challenger bank was largely attributed to failed migration of lending systems post-sale to another European bank, impacting millions of customers. |

**Source:** BCG Analysis.

## 8 key imperatives for core banking modernization

At BCG, thanks to our extensive experience working with banking clients across geographies including Southeast Asia, we have identified eight imperatives that make a compelling case for the urgent modernization of CBS—customers, competition, products, data capability, technology, cost, regulatory, and employees.

### IMPERITIVE 1: INCREASING CUSTOMER EXPECTATIONS

With digital offerings ranging from ride-hailing to buying groceries, customers today are increasingly accustomed to on-demand and personalized services. They expect the same service quality and responsiveness from their banks. This is particularly true for the digitally savvy millennials—a key and growing customer segment in Southeast Asia.

Core banking impact: To enable hyper-personalized banking services, CBS platforms need to provide enhanced configurability, modularity, and flexible workflows that enable quick change. One such example would be to enable a highly targeted campaign by accessing behavioral data (e.g., payment patterns, past loan applications) from existing products and previous campaigns, and then overlay new changes for rapid deployment.

### IMPERATIVE 2: INTENSIFYING DIGITAL COMPETITION

Modern fintechs and neo-banks provide fully digital customer experiences, such as online account opening, with on-demand service fulfilment and innovative product features. They are also able to embed new offerings seamlessly across a variety of customer journeys. This has become the standard for service delivery in today's intensifying digital competition landscape.

**Core banking impact:** Legacy CBS solutions are not designed to deliver such flexibility, given they often operate on batch-based and end-of-day processing dynamics—and because the design assumes that transactions will be initiated on the platform itself and not via a channel. They lack product configurability and are unable to easily integrate with new channels at speed and scale, limiting agility and speed of movement for banks.

This has resulted in some banks not being able to digitally enable the need for on-demand service fulfilment such as drawing down on an approved loan via self-service channels and having to resort to manual, error-prone workarounds to support the same.

## IMPERATIVE 3: SEIZING NEW REVENUE OPPORTUNITIES

Banks are actively pursuing new revenue opportunities through integration into the broader financial ecosystem, as well as adjacent non-financial platforms through open banking, embedded finance, and partnerships. For example, in recent years banks have launched digital wallets and buy now pay later (BNPL) services in partnership with fintechs and ecommerce firms to target younger, digital-savvy customers.

**Core banking impact:** Legacy CBS are typically tightly coupled systems that support proprietary integration protocols and formats. This makes it challenging to integrate with other internal platforms—let alone third-party ecosystems. This is where CBS needs to be able to offer all core services and capabilities through secure and efficient application program interfaces (APIs) that can enable seamless and rapid integration with external platforms.

## IMPERATIVE 4: ADOPTING DATA-DRIVEN OPERATIONS

Leading organizations have made data a critical cornerstone of their operating model to establish a competitive edge. This involves setting up a robust foundation for high-quality, granular, and timely data across product manufacturing and service fulfilment areas.

Applying advanced analytics on this comprehensive data lake offers several benefits to the bank. For example, it enables the set-up of an 'operations lighthouse' which provides near-real-time operational metrics and signals to proactively address operational bottlenecks, improve straight-through processing (STP), and reduce errors. Additionally, it can facilitate insights into customer product usage and consumption which can be used to craft targeted cross-sell and up-sell opportunities.

Banks are already processing core banking data through advanced analytics in three critical areas. The first is in driving operational efficiency, for example parsing documents to pre-fill customer and product data. The second is exception or anomaly detection, identifying irregular employee behavior such as repeated generation of sensitive reports or execution of a query by a specific user. And finally, in predictive insights, for example identifying a high incidence of operational errors that can then prompt for timely training or other steps.

**Core banking impact:** Legacy CBS solutions often lack comprehensive event-logging capability, such as the ability to capture detailed information about customer activity, users, and interacting systems. In many cases, it's also not possible for CBS to provide seamless access to this data and metadata. Furthermore, legacy CBS only store data in traditional relational databases. Depending on the type of data, it may be more effective to use alternative storage options. For example, one can use columnar data stores for interface payloads, while graph data stores may be better suited for deriving insights from customer and related party data. These limitations represent a significant missed opportunity for banks, as it prevents them from gaining valuable insights needed to enhance their product offerings, marketing strategies, and operational efficiency.

## IMPERATIVE 5: LEVERAGING NEWER TECHNOLOGIES

As we have discussed, banks are increasingly adopting self-service channels, embedded finance opportunities, hyper-personalization, and data-driven outcomes. This has

necessitated a need to enhance scalability and agility, efficiency for product development and deployment, as well as design for resiliency and data outcomes. This in turn is driving the need to change the fundamental architecture and technology stack that has been used for application development— these include a shift towards cloud-native architecture, use of micro-services for application development and leveraging AI/ML for automating complex tasks and decision-making processes.

Core banking impact: The nature of transactions has significantly transformed in today's digital banking era, marked by a steep increase in volumes of customer interactions and shift in transaction profile. Legacy CBS technology stacks are unable to scale and adapt to these demands resulting in operational issues and higher costs.

There are several examples of these gaps. In digital marketing, modern campaigns differ significantly from traditional ones, characterized by specific targeting and enhanced reach and access. For example, a cash-back offer campaign during a specific period such as salary day or at mealtimes could translate up to a 6x to 8x volume increase. This campaign-driven volume surge can last from a few hours to a few days, and CBS need on-demand capabilities such as auto-scaling to handle this dynamic volume successfully in a cost-efficient manner.

The need for resiliency and "digital immunity" has also prompted new architecture patterns. For example, we see that some offerings in the CBS space adopt cell-based architecture that helps to achieve fault isolation such that in case of an issue only a part of the workload is impacted. With a cell-based architecture if there are 5 cells in operation, a failure in 1 cell with impact only 20% of the workload and 80% of the workload remains unaffected.

### IMPERATIVE 6: IMPROVING COST EFFICIENCY

Banks are facing significant pressure to reduce operating costs and demonstrate better ROI on their technology investments. This is acutely important when framed against the anticipated correction of higher interest rates currently prevalent in markets across the region. Cost-effective operations are also a path for banks to compete with neobanks and fintechs. It is crucial for banks to minimize 'run-the-bank' technology expenses and allocate more resources towards 'change-the-bank' initiatives to enhance their competitive edge.

Core banking impact: CBS running on legacy mainframe architecture can be costly. The issue of volume surges is one clear area with major cost implications. Consider the cost of permanently adding suitable transaction processing capacity to support a 6X to 8X peak load in the absence of auto-scale-up and scale-down capabilities offered by current cloud-native solutions. In addition, consider the cost of replacing or upgrading obsolete components and technologies that have outlived their extended life. The only options then are to be held hostage by the provider for additional support or investing in upgrading the technology—both of which are expensive propositions and pose significant resilience risk.

### IMPERATIVE 7: EXPANDING REGULATOR DEMANDS

There are increasing regulatory demands for IT resilience globally, including in Southeast Asia. This has a significant linkage to the board and management of the bank. There have been numerous examples of regulators imposing fines to send a clear message on the importance of this topic. For example, one Singapore-based bank was fined over SGD1 billion in additional capital charges a couple of years back due to multiple banking service disruptions.

Core banking impact: Enabling seamless access to customer-critical online services to a customer via a mobile app or internet banking platform can require over 50 applications, with CBS being integral. Not only does each of these individual applications need to align with a bank's recovery commitments in the case of an incident, but the cluster of disparate applications with differing operating mechanisms (such as active-active vs. active-passive setups across primary and secondary data centers) need to recover within the required

recovery time window. Legacy CBS are often unable to cater to complex recovery requirements in the face of chaotic conditions encountered during critical incidents, which are very different from pre-planned, carefully curated drills executed annually by banks.

The changing demands on CBS capabilities and capacity, as mentioned earlier, raise concerns about the resilience offered by legacy core banking solutions. Changes made to extend the current product functionality—even when minimized or mitigated by building new and separate modules—compromises the original level of resilience embedded in the CBS platform.

### IMPERATIVE 8: ENHANCED EMPLOYEE EXPECTATION

Like customers, bank staff also expect superior experience and sophistication in the technology solutions they use at work every day. In addition, banks' technology workforce is increasingly seeking opportunities to work with modern technologies and adopt better ways of working, drawing on insights gained from other tech companies and fintechs. Meeting these enhanced employee expectations underpins the essential imperative of attracting and retaining the right talent for banks.

Core banking impact: Users of legacy CBS are often frustrated due to cumbersome screens, navigation menus that have become overly complex over time, and dealing with numerous manual processing steps. Additionally, the restrictive controls on these platforms can further limit their efficiency. The lengthy cycles to implement, test, and deploy changes also negatively impacts motivation. Banks need to have in place CBS solutions that provide optimal user experience while supporting efficient ways of working enabled by agile development processes. This is closely linked to enhancing the employee value proposition for a bank's operations and technology staff.

## What this means for banks

The imperatives cited in this report are not ad-hoc changes or temporary shifts—they are irrefutable and irreversible changes in the banking landscape, and ones which have been gaining momentum over the last decade. They reflect a fundamental reshaping of the banking industry, underpinning a drive towards customer-centricity, innovation, and greater efficiency.

Legacy CBS solutions are hampering banks' abilities to keep pace with changes in the overall financial services landscape. CBS modernization is no longer a choice or a tech-only agenda for banks in Southeast Asia—it is a business imperative for banks to avoid being left behind.

In the next paper, we will delve into the 'how' of CBS modernization, providing insights into methodologies and actionable strategies to increase the chances of successful implementation. It will include an in-depth analysis of modernization options for legacy CBS—lean/hollow-out and upgrade or co-exist with new digital cores or replace—along with critical success factors such as close biz-tech collaboration, strong design authority, alignment of vendor incentives, and strategic roll-out sequencing for execution.

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