Building Resilient, Intelligent Infrastructure for the Digital Bank

A Strategic Playbook for Banking & Financial Services Leaders

Hitachi Vantara | BANKING **DIVE**

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Introduction

Modernization Is Now a Requirement, Not a Choice

Financial institutions are navigating one of the most consequential technology transitions in decades. Data volumes are exploding, regulatory expectations are intensifying, and cyber threats are escalating in sophistication and frequency—while AI is redefining operating models and competitive advantage. In this environment, modernizing data storage infrastructure arrays is no longer optional—it's urgent.

Modernization is now a **regulatory expectation**. Boards and supervisors expect demonstrable resilience, clean recoverability, and defensible governance across hybrid environments.

Modernization provides the audit-ready controls, attestations, and automation regulators are asking for—today, not in theory.

What's more ransomware and destructive attacks target data, not just compute. Clean-room recovery, immutable snapshots, and air gapped cyber vaults are table stakes. Without them, recovery windows and customer trust remain at risk.

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Modernization is also a **business imperative** as every missed opportunity to automate, optimize, or accelerate becomes a competitive gap. End-of-support cycles and talent constraints increase operational risk. Aging platforms raise failure probabilities, prolong maintenance windows, and drain scarce specialist resources. Modern arrays automate provisioning, tiering, and protection—freeing teams to focus on revenue-driving work. And *cost-to-serve* must drop as margins compress. Storage efficiency (compression/dedup), autonomous tiering, and energy-efficient NVMe architectures lower TCO while improving performance and availability.

Lastly, forward planning financial institutions leaders are aware that AI will compound data gravity and infrastructure stress. As current as well as new agentic and real time AI services demand consistent sub millisecond latency, high throughput pipelines, and vector ready storage. Legacy arrays become the bottleneck.

The strategic choices leaders make today will determine their operational integrity, customer trust, and AI readiness for the next decade. This playbook explores how leading institutions are approaching modernization, and how Hitachi Vantara—trusted by more than 70% of top global financial organizations—helps them build the hybrid, resilient, and AI-ready foundation required for the next era of digital finance.

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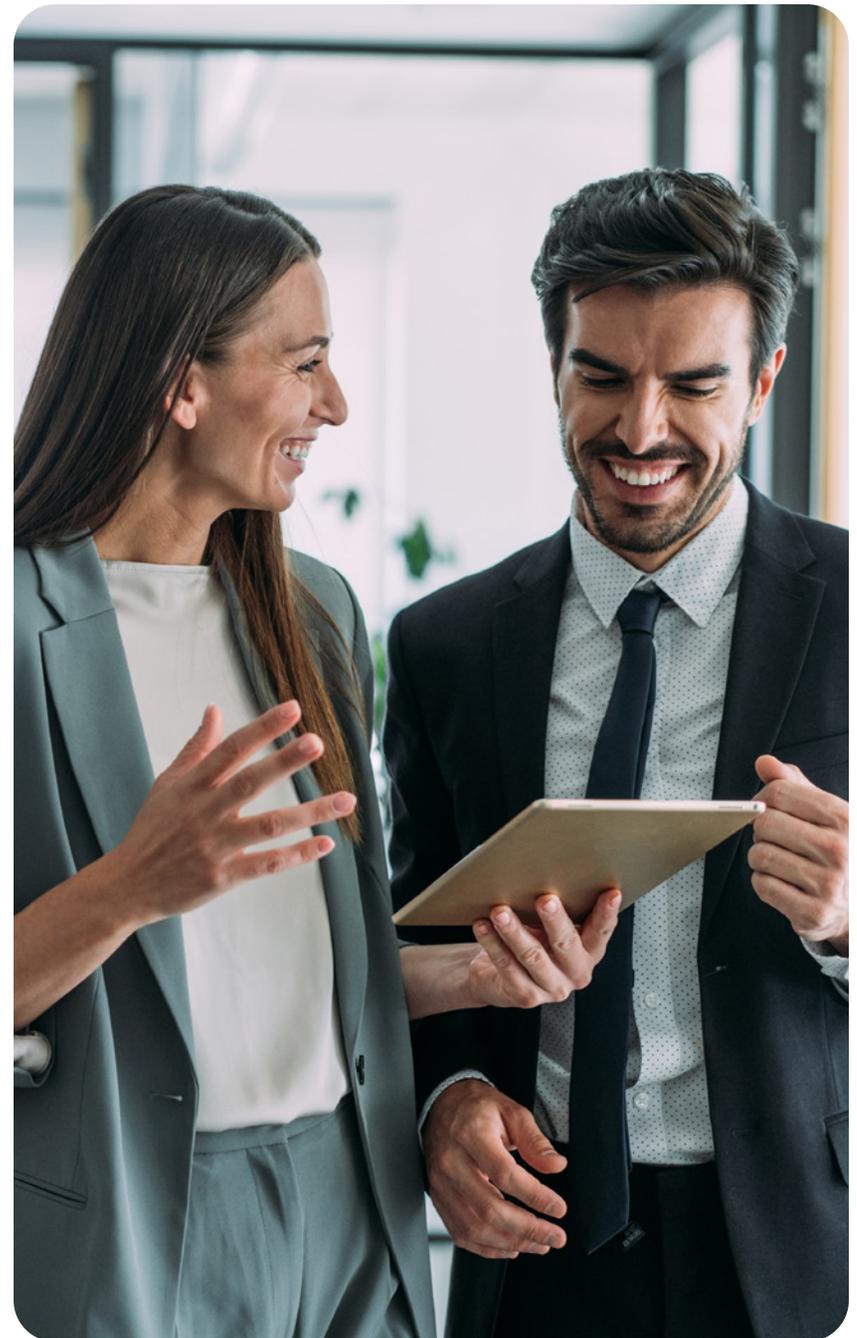
Four Forces Reshaping Financial Infrastructure

Financial institutions have always operated under stringent requirements, but the last five years have pushed technology environments into unprecedented complexity. Four major forces are driving urgent transformation:

1. Explosive Data Growth and Always-On Expectations

Transactions, digital interactions, real-time decision engines, fraud analytics, and AI pipelines all generate massive data volumes. BFS workloads require millisecond latency, zero tolerance for missing records, and sustained performance even during peak traffic moments.

2. Data Governance, Privacy, and Data Sovereignty

Data sovereignty—the ability to control, localize, audit, and attest to where data resides and how it moves—has reshaped infrastructure strategy. Compliance bodies expect not just privacy, but traceability, explainability, and end to end governance for every class of data. Modern storage arrays enable geo fencing, policy based localization, per tenant encryption, centralized KMS, WORM archives, and immutable retention to prove control and compliance.

3. Cyber Resilience as a Board-Level Concern

Expectations are codified around clean recoverability, immutable data protection, and operational continuity. Institutions must prove that critical systems can recover cleanly within defensible RTO/RPO windows—including protection against malicious encryption, deletion, or corruption—with isolated recovery environments and forensic validation. For the first time, many banks are being asked: Can you prove that your systems will recover cleanly within a defensible time window?

4. The Coming Wave of Agentic AI Workloads

As AI evolves financial institutions must be ready to employ it in the right way that works for them to stay competitive. Autonomous service agents and AI-driven operations will increase **volume, velocity, and complexity** of data by an order of magnitude. Infrastructure that cannot **scale linearly, vectorize data,** or **support hybrid AI workflows** (training, inferencing, retrieval) risks becoming an **operational bottleneck.**

Responding to these pressures requires more than incremental upgrades; it demands an architectural model built for both control and agility.

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Hybrid Cloud

The Path to Agility, Compliance, and Data Sovereignty

Five years ago, many enterprises believed in a fully cloud-based future. Today, BFS leaders understand that most institutions will operate in hybrid mode indefinitely.

Why Hybrid Is Now the Dominant Model

Strict data-sovereignty rules, cross-border transfer restrictions, and sector-specific regulations require that certain information remain inside environments the bank directly controls. This applies especially to the data processed through mainframes and other core transactional systems.

Hybrid isn't a compromise; it is the only model that aligns performance, sovereignty, and modernization pressures across multiple capital cycles.

At the same time, financial institutions rely on speed and flexibility. Banks need the option to leverage secure cloud environments where it makes sense, experiment with new AI-powered services, and integrate partners and ecosystems quickly, without giving up control.

Hybrid reconciles these demands as it delivers:

- Sovereign infrastructure for regulated workloads (data localization, policy-based placement, auditable control planes)

- Public cloud agility where elasticity and rapid iteration matter

- A consistent operating model across core, edge, and cloud (uniform data services, protection, and observability)

- A defensible governance framework that satisfies auditors and regulators

Hybrid isn't a compromise; it is the only model that aligns performance, sovereignty, and modernization pressures across multiple capital cycles. And Hitachi provides a fully mature hybrid solution.

Hitachi Vantara's Differentiated Hybrid Approach

Hybrid environments are now the norm in financial services, but fragmentation and manual controls make them difficult to govern, secure, and scale. Modern platforms must simplify operations while preserving control, auditability, and performance. Hitachi's VSP One platform accomplishes this by bringing cloud-like operational efficiency to on-prem environments while unifying data management across hybrid estates. The platform provides:

A Unified, Automated Operating Model

- Infrastructure-as-Code provisioning eliminates ticket-driven delays.

- A unified control plane manages Hitachi and non-Hitachi arrays, cloud connections, and data mobility.

- AIOps-driven analytics anticipate threshold breaches and optimize workload placement automatically.

For banking and financial services, operational efficiency alone is not enough. Platforms must deliver deterministic performance, predictable behavior, and resilience under peak transaction and regulatory stress.

Performance and Efficiency Engineered for BFS Needs

- Up to 50 million IOPS to sustain peak transaction cycles.

- Guaranteed 4:1 data reduction, lowering total cost of ownership.

- Built-in sustainability and power-efficiency guarantees.

- Full mainframe support, essential for decades-old core investments.

Hybrid modernization is not about migrating to cloud. It's about placing each workload in the right environment with governance, performance, and resilience engineered in from the start.

Business Preservation Comes First

Outdated storage systems now represent a direct business risk. Research from **S&P Global's 451 Research** shows:

- **One in three enterprises** has experienced an outage or slowdown due to storage performance issues.

- The **average outage costs $2.05 million**.

- **23%** of failures were caused by security incidents.

Resilience begins at the storage layer. Legacy infrastructure increases operational risk, financial exposure, and regulatory vulnerability. Hybrid modernization resolves these issues by strengthening the core while enabling cloud elasticity to deliver performance, sovereignty, and resilience that neither legacy systems nor full cloud models can offer alone.
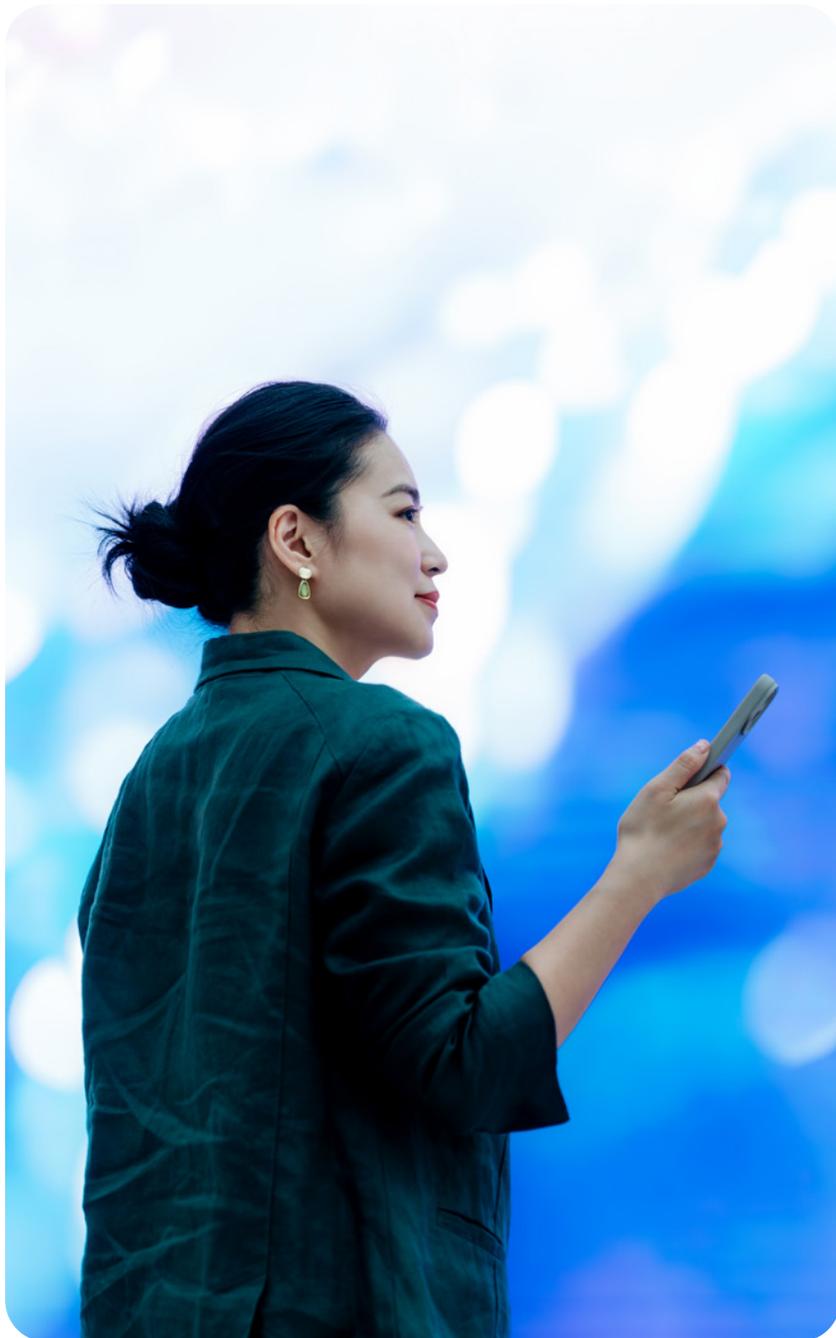
Cyber Resilience

The New Currency of Trust

Today, trust in financial services is increasingly tested by sophisticated ransomware attacks, operational failures, and cascading outage risks introduced by interconnected systems.

BFS leaders now view cyber resilience through two lenses:

1. **The threat landscape is real and worsening.** Attack sophistication continues to evolve. Backup-centric models are no longer adequate.

2. **Regulation is accelerating action.** DORA, NYDFS Part 500, MAS, FSCA, and others are establishing minimum resilience requirements.

How Modern Cyber Resilience Responds: Baseline vs. Advanced Execution

While many solutions claim cyber resilience capabilities, the difference lies in execution under real-world stress. The comparison below highlights how baseline market approaches differ from **advanced, regulator-defensible resilience**. Hitachi's approach extends beyond table-stakes protection to deliver more robust outcomes.

Modern Requirement	Table-Stakes Response	Advanced Hitachi Response
Immutable recovery points	Snapshots protected from deletion or encryption	Hardware-enforced immutability with verifiable lineage and availability guarantees
Clean-state identification	Periodic testing and manual validation of backups	AI-driven analysis to identify the defensible last known good state across long-dwell attacks
Recovery at scale	Restore individual systems or small application sets	Orchestrated recovery of tens of thousands of interdependent VMs and applications under regulator-acceptable timelines
Ransomware detection	Signature-based or reactive alerting	Intelligence that detects subtle behavioral anomalies across data, snapshots, and access patterns
Protection of clean data	Logical isolation or delayed replication	True air-gapped vaulting—physical and virtual—unreachable by lateral-moving attackers
Recovery execution	Runbooks and human-driven response	Automated, policy-driven orchestration that enforces sequence, consistency, and speed
Auditability	Post-incident documentation	Built-in audit trails and verifiable recovery evidence aligned to regulatory expectations
Regulatory readiness	Controls mapped to frameworks	Recovery outcomes demonstrably aligned with DORA, NYDFS, MAS, and similar mandates

As cyber resilience becomes a baseline expectation, the ability to execute reliably at scale becomes the differentiator. With that foundation in place, financial institutions can turn to the next mandate: deploying AI in ways that deliver measurable value without introducing new operational, regulatory, or reputational risk.

Modernization That Delivers ROI, Not Risk

As institutions move from pilots to production, they encounter four recurring blockers:

1. Siloed or poorly governed data creates risk and inconsistent performance

2. Infrastructure cannot move data at scale without latency or corruption

3. AI systems must operate within strict compliance boundaries

4. Future AI workloads require fundamentally more capable infrastructure
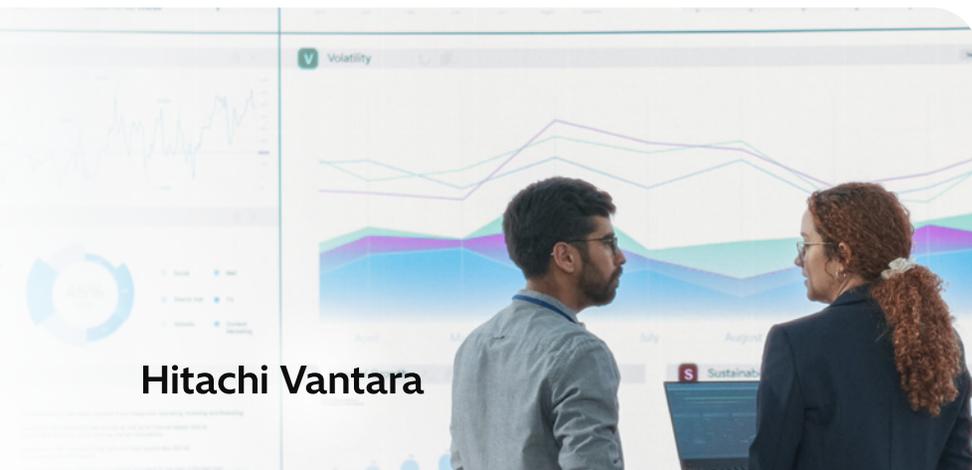
Hitachi Vantara's Builds for the Financial Enterprise of the Future

Modernization for Mission-Critical Banking Applications and AI Value

Hitachi Vantara enables financial institutions to modernize mission-critical business applications—from core banking and payment systems to regulatory reporting and risk engines—while unlocking measurable value from AI initiatives through a structured, low-risk approach. The journey begins with targeted Discovery Sprints that identify high-impact use cases with clear ROI, such as:

- KYC automation to accelerate onboarding and compliance

- Fixed-income analytics for faster, more accurate trading decisions

- Fraud detection leveraging real-time data streams

- Developer productivity through automated workflows and secure data access

Rather than relying on generic AI models, Hitachi employs curated, domain-specific AI models designed for financial services. These models deliver higher accuracy and lower operational and regulatory risk, supported by robust data-governance frameworks that ensure every AI outcome is explainable, traceable, and compliant with financial sector standards.

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Commitment to Mainframe Excellence for Banks

Modernization isn't just about AI—it's about ensuring the resilience and performance of mission-critical workloads that banks depend on every second of every day. Hitachi Vantara is committed to providing the highest-quality mainframe storage arrays in the industry, delivering:

- Unmatched reliability and availability for core transactional systems

- Predictable, sub-millisecond latency for high-volume payment and trading platforms

- Non-disruptive upgrades and active-active clustering to eliminate downtime

- Integrated cyber resilience with immutable snapshots and clean-room recovery

- Compliance-ready sovereignty controls for regulated data environments

With Hitachi's enterprise-grade mainframe storage, financial institutions can confidently modernize their infrastructure to support mission-critical applications, meet regulatory mandates, and prepare for the next wave of AI-driven innovation—without compromising on security, performance, or trust.

At the core of this ecosystem are Hitachi iQ solutions, which span cloud and on-prem environments. Hitachi iQ:

- Integrates AI software, accelerated compute, robust networking, intelligent storage into turnkey, sovereign AI solutions

- Delivers performance and scale required by AI workloads

- Supports block, file, and object formats needed for LLM and multimodal workloads

- Offers low-code AI agent builder tools and a library of agent blueprints

Together, these capabilities allow institutions to deploy AI confidently to scale innovation while maintaining the precision, control, and trust the industry demands.

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Hitachi Vantara's enterprise storage portfolio and data services platform provide:

- High-end block arrays engineered for extreme availability, deterministic latency, and non-disruptive operations

- Sovereignty controls: geo fencing, data locality policies, customer-managed keys, immutable storage, and auditable governance

- Cyber resilience: immutable snapshots, air gapped cyber vault, clean-room recovery, and automated validation workflows

- Hybrid consistency: unified protection, observability, and automation across core, edge, and cloud

- AI-ready data pipelines: high-throughput ingest, vector-friendly data services, and seamless integration to model-training/inference environments

Trusted by more than 70% of top global financial organizations, Hitachi Vantara helps institutions modernize without compromise—aligning sovereignty, resilience, performance, and cost in one architecture.

Preparing for the Future

AI represents a fundamental break from today's analytical models. Institutions cannot afford architectures that expire within a single refresh cycle. Hitachi's approach, designed explicitly to endure across **two full capital cycles**, ensures that organizations are not trapped in forced upgrades or punitive cloud consumption models. Instead, they gain an AI-ready foundation that scales predictably and supports executable, operations-level automation.

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Financial Infrastructure Maturity Model

To translate these priorities into action, financial leaders need a clear way to assess where they are today and what must change next. This maturity model provides a structured way for banks to evaluate their current posture and define a practical path toward continuous modernization.

LEVEL 1

Fragmented, Legacy-Bound Infrastructure

Characteristics

- Aging on-prem systems and mainframes

- Manual processes for resilience, backup, and recovery

- Siloed data with inconsistent governance

- Limited cloud adoption

- Long provisioning cycles

Gaps

- High cost and inflexibility

- Exposure to ransomware and compliance risk

- Inability to meet latency and data-quality expectations

- Little or no readiness for AI or automation

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Hybrid Foundations with Sovereign Control

Characteristics

- Defined workload placement strategy

- Sovereign control over regulated data

- Early performance-tiering and automation

- Initial modernization of storage

Gaps

- Resilience not yet engineered into the platform

- Growing operational complexity across environments

- AI slowed by inconsistent data access and quality

Resilient, Automated Enterprise Infrastructure

(Where many leading banks are aiming today)

Characteristics

- Immutable snapshots and secure, tamper-proof recovery points

- Automated, intelligence-driven ransomware detection

- Recovery-at-scale for thousands of VMs and applications

- Unified management across hybrid environments

- Measurable availability guarantees

Gaps

- Fragmented pipelines across storage types

- Limited readiness for agentic AI workloads

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AI-Ready, Data-Unified Infrastructure

Characteristics

- Unified metadata and vectorization pipelines

- Multimodal support across block, file, and object

- High-density performance can meet agentic AI demands

- Transparent governance for explainability

- Predictable workload behavior across hybrid environments

Gaps

- High cost and rigidity without lifecycle management

- AI innovation may outpace infrastructure refresh cycles

Continuous Modernization

(Hitachi EverFlex Enabled)

Characteristics

- Modernization as a continuous, non-disruptive process

- Elastic scalability without forced refreshes

- Risk-free migrations

- Flexible consumption models

- Unified resilience and AI readiness across core and edge

Outcomes

- Cost efficiency and resilience improve simultaneously

- Avoids punitive economics of over-consumption in public cloud

- Architecture absorbs regulatory, cyber, and AI pressures across capital cycles

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Trust Is the Outcome of Infrastructure Quality

Banking is built on trust, and today, trust is inseparable from the strength of a bank's infrastructure. Hitachi Vantara provides more than technology: it delivers assurance. Through hybrid-cloud architectures, modern resilience frameworks, and AI-ready data systems, financial institutions gain a foundation that supports operational certainty today and scalable innovation tomorrow.

Modernize storage now to:

1. Satisfy sovereignty and resilience mandates with auditable, enforceable controls

2. Protect revenue and trust with clean recoverability and always-on experiences

3. Unlock AI at scale without infrastructure bottlenecks

4. Lower TCO while improving agility and compliance posture

In an era defined by AI acceleration, rising cyber risk, and tightening regulation, trust is not an aspiration. It is a measurable result of architectural decisions. With Hitachi's modern, sovereign, and resilient platforms, institutions can modernize responsibly, operate confidently, and build the digital core that will sustain their competitiveness for years to come.

Ready to build a sovereign, resilient, AI ready data foundation for the next decade of digital finance? Let's tailor a modernization roadmap for your core, edge, and cloud—optimized for banking workloads and regulatory realities.

Learn more about Hitachi Vantara.

Trust is not an aspiration. It is a measurable result of architectural decisions.

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Hitachi Vantara is transforming the way data fuels innovation. A wholly owned subsidiary of Hitachi, Ltd., we're the data foundation the world's leading innovators rely on. Through data storage, infrastructure systems, cloud management and digital expertise, we build the foundation for sustainable business growth.

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