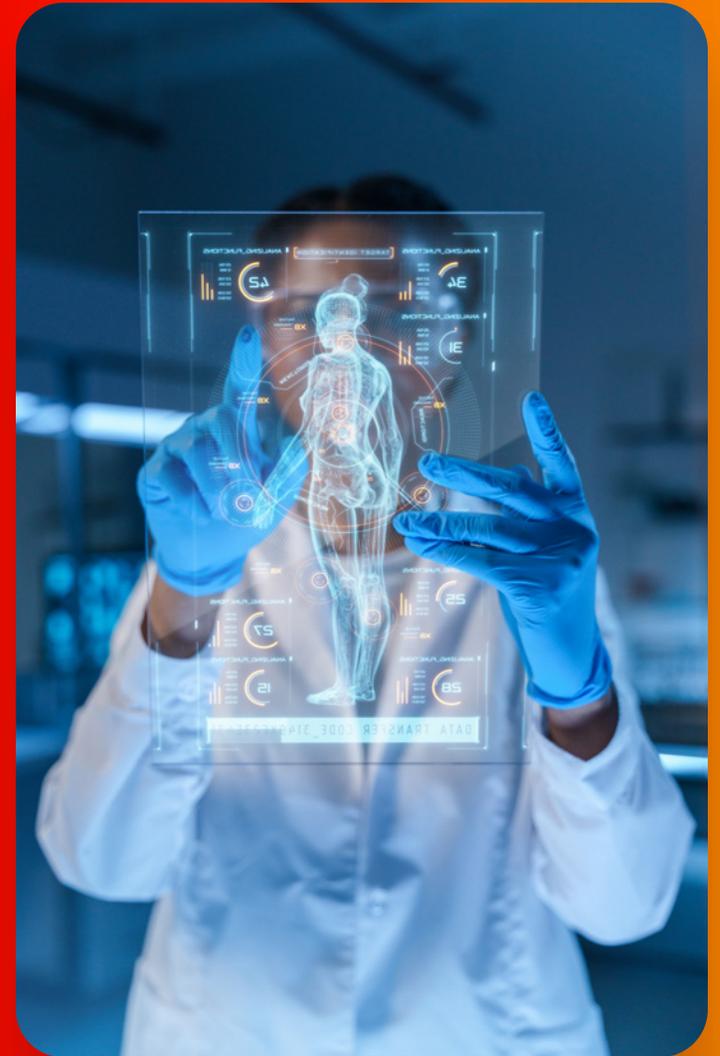# Modernizing the Healthcare Digital Core for an AI-Driven Future

Securing Care Delivery with Hybrid Infrastructure, Cyber Resilience, and Trusted Data

Hitachi Vantara | ⓓ HEALTHCARE**DIVE**

Introduction

Healthcare in the United States is undergoing one of the most complex operating revolutions in its history. Many health systems continue to face unfavorable margins amid rising labor costs, staffing shortages, aging digital infrastructure, and increased dependency on technology to deliver care. At the same time, cyberattacks have escalated in frequency and severity, directly affecting patient safety, care continuity, and consumer trust.

Executives across the ecosystem are increasingly aligned on one reality: **modernization is no longer an option**. It is now a strategic and operational mandate essential to sustaining care delivery, protecting patient trust, and enabling the next generation of AI-supported clinical workflows.

Modernization is now a strategic and operational mandate essential to sustaining care delivery, protecting patient trust, and enabling the next generation of AI-supported clinical workflows.

Underpinning all these concerns is a single strategic asset: data. Every modernization initiative, whether hybrid cloud, AI, virtual care, workforce optimization, or supply chain transformation depends on governed, high-quality, continuously available data. The question is how to get there.

This playbook examines how healthcare organizations can modernize their digital core across three interdependent pillars: **hybrid cloud infrastructure, cyber resiliency,** and **AI-ready data ecosystems.**

Drawing on insights from Hitachi's extensive healthcare heritage— including decades of medical technology innovation, direct hospital operations, and thousands of healthcare-focused engineers—this playbook outlines a pragmatic, secure, and responsible path forward for providers modernizing under pressure.

3 PILLARS OF DIGITAL CORE MODERNIZATION IN HEALTHCARE
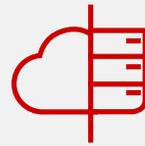
Hybrid Cloud Infrastructure

Balances on-premises performance with cloud agility.

Cyber Resiliency

Protects clinical and operational continuity.

AI-Ready Ecosystems

Built on trusted, integrated, well-governed data.

Hitachi Vantara

Hybrid Cloud

*The Foundation for
Healthcare Modernization*

Hybrid cloud has become the dominant architecture in regulated industries because it solves a specific set of tensions: data sovereignty versus agility, control versus speed, and risk versus innovation.

Healthcare organizations are discovering that neither a "cloud-only" nor "on-prem-only" approach is workable at scale. They want to keep certain data and workloads under direct control while still benefiting from the cloud's elasticity and innovation. Hybrid offers not just architectural balance, but financial balance allowing leaders to allocate workloads based on risk, regulatory exposure, and cost structure rather than defaulting to a one-size-fits-all infrastructure model.
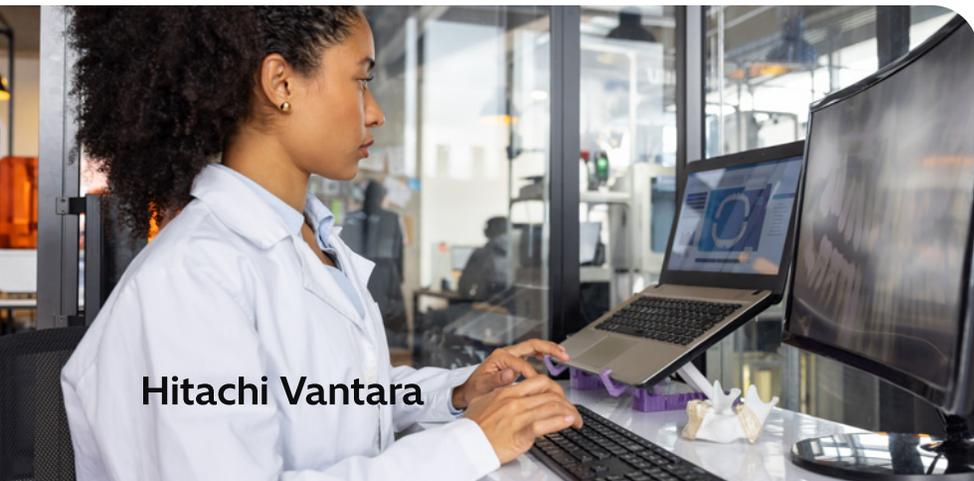
Data Sovereignty and Compliance

Regulated entities have spent years building policies to satisfy privacy, security, and transparency obligations. As new digital and AI-powered services emerge, those same obligations now apply to a far more complex environment.

Leaders are asking:

- Can I attest to regulators, boards, and patients that we control how data is accessed and processed?

- Are we depending on third-party cloud environments in ways that create cross-border or cross-jurisdiction risk?

A hybrid model addresses these concerns by allowing organizations to keep protected health information and other sensitive datasets in a controlled, sovereign environment. It then enables the use of public or partner clouds for less sensitive or more elastic workloads. But data sovereignty without performance won't satisfy modern workload demands.

Hitachi Vantara

4
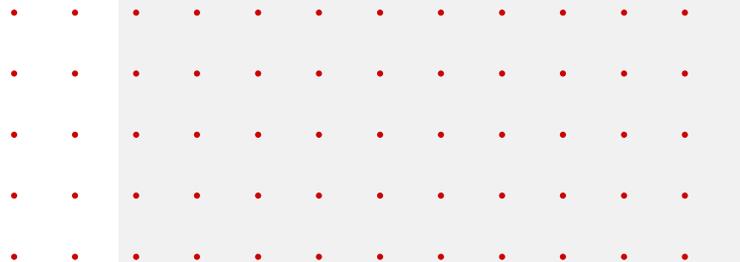
Performance and "Always-On" Expectations

Clinical applications cannot tolerate substantial latency, data gaps, or unpredictable performance for ICU monitors, a pharmacy dispensing system, a patient portal, or a registration kiosk.

As a response, hybrid cloud allows organizations to:

- Run latency-sensitive core workloads on high-performance infrastructure close to the point of care.

- Offload analytical, development, or experimental workloads to cloud resources.

- Avoid over- or under-provisioning by aligning capacity with actual demand.

The result provides technical optimization as well as a consistent digital experience for clinicians and patients.

Hybrid is not simply a mix of environments; it is a managed, governed, and observable digital core.

Unified Management Across the Data Estate

The reality is that most healthcare organizations are already hybrid. They have diverse storage arrays, multiple cloud providers, and a mix of legacy and modern applications. The challenge is unifying this into a coherent, governable environment.

Hitachi Vantara achieves this by emphasizing:

- A unified management layer that provides visibility and control across the entire data estate including on-premises, in the cloud, and even on non-Hitachi arrays.

- Common policies for performance, security, and data protection across platforms.

- Insights into workload behavior and I/O patterns that inform better capacity planning and risk reduction.

Hybrid, in this sense, is not simply a mix of environments; it is a managed, governed, and observable digital core. That is the true foundation for modernization. And the advantages extend to the organization's cyber resiliency as well.

Hitachi Vantara

Cyber Resiliency

Safeguarding Data and Sustaining Care

Cyberattacks in healthcare can halt surgeries, delay treatments, and force ambulances to divert. Executives now view cyber resiliency as a direct component of patient safety and organizational viability. Boards and executives are increasingly framing cyber resiliency in these two dimensions:

- **Clinical impact:** Can we continue to deliver care safely and reliably during an incident?

- **Business impact:** Can we sustain operations, avoid catastrophic downtime, protect our reputation, and meet our regulatory obligations?

Healthcare organizations that invest in resilient digital cores are better positioned to maintain continuity of care even when parts of the environment are compromised. They can also demonstrate to regulators and partners that they have credible, tested recovery strategies. All this strengthens trust among patients, clinicians, and communities.

Hitachi Vantara

Beyond Backups: What Modern Resiliency Requires

Traditional backup alone cannot keep pace with today's threat landscape. Modern cyber resiliency requires:

- **Immutable copies of data** that cannot be altered or encrypted by attackers.

- **The ability to roll back with precision** to a clean, known-good state.

- **Strong cryptographic controls** and industry-standard security features to protect data at rest and in motion.

- **Continuous monitoring and analytics** to identify risky configurations, unused assets, and potential exposure points.

- **Architectures designed for high availability**, so that single points of failure do not jeopardize critical services.

Hitachi Vantara's data availability guarantee, combined with immutable snapshotting and cyber-resiliency services, gives healthcare organizations both the technical and operational elements they need to respond to disruption.

AI-Ready Data

Turning Insight Into Impact

AI has become central to healthcare transformation, but **AI delivers value only when the data foundation is trustworthy, governed, and operationally sound**. A successful AI program depends on data that is accurate, contextualized, and compliant; governed by clear ownership and policy; integrated across clinical, operational, and financial domains; and protected by rigorous privacy and security controls. It also requires infrastructure that can absorb both routine workloads and compute-intensive bursts without compromising performance.

When organizations attempt to introduce AI on top of fragmented, opaque, or poorly governed data environments, it results in stalled pilots, regulatory friction, and clinician mistrust. Therefore, AI readiness must include disciplined data management and a resilient digital core.

An AI-Ready Infrastructure: Block, File, Object, and Beyond

Hitachi Vantara responds to the stringent demands of AI workloads by supporting the full diversity of healthcare data (structured, unstructured, clinical, operational) across block, file, and object storage. This matters because:

- **AI workloads often require access to multiple data types at once** like images, notes, logs, telemetry, documents, and transactional records.

- **Data used for AI must be extracted, transformed, and vectorized** without compromising integrity, latency, or security.

- **Clinical and AI workloads must coexist** without starved capacity or degraded performance.

Hitachi Vantara

From Descriptive to Predictive and Agentic

With this foundation in place, healthcare organizations can responsibly scale use cases such as:

- Predictive demand and capacity forecasting for inpatient and emergency services.

- Intelligent patient flow and bed management, as seen in smart hospital initiatives.

- Early warning systems for deterioration, falls, or avoidable readmissions.

- Advanced research environments for genomics, oncology, and population health.

Looking ahead, the industry is moving beyond isolated models to *agentic AI*. These systems can orchestrate tasks across the data landscape, from gathering and preparing inputs to triggering workflows and surfacing insights autonomously.

Agentic AI will introduce substantially higher infrastructure demands driven by continuous orchestration, stateful memory, and multi-step workflows that exceed the footprint of traditional AI. This means healthcare organizations require platforms that can sustain heavier, more complex workloads over multiple capital cycles without disruptive hardware refreshes or costly lock-in. Infrastructure, therefore, must be capable of supporting mission-critical systems today and the next generation of AI-driven services tomorrow.

Agentic AI will introduce substantially higher infrastructure demands driven by continuous orchestration, stateful memory, and multi-step workflows that exceed the footprint of traditional AI.

Financial Health Through Data Intelligence

Visibility as a Strategic Financial Lever

A clear view of the digital estate helps organizations avoid habitual overprovisioning with informed, predictable investment. It also reveals redundant systems and shadow IT, allowing health systems to consolidate around a defined digital core and eliminate the hidden costs embedded in fragmentation. When clinical, operational, and financial data are governed as a single asset, organizations improve claim accuracy, reduce denials, and protect revenue integrity.

Hitachi Vantara's discovery and analytics capabilities give leaders the objective picture required to make these decisions and identify where risk or waste is accumulating. This visibility becomes the foundation for targeted modernization, defensible capital planning, and a more resilient financial future.
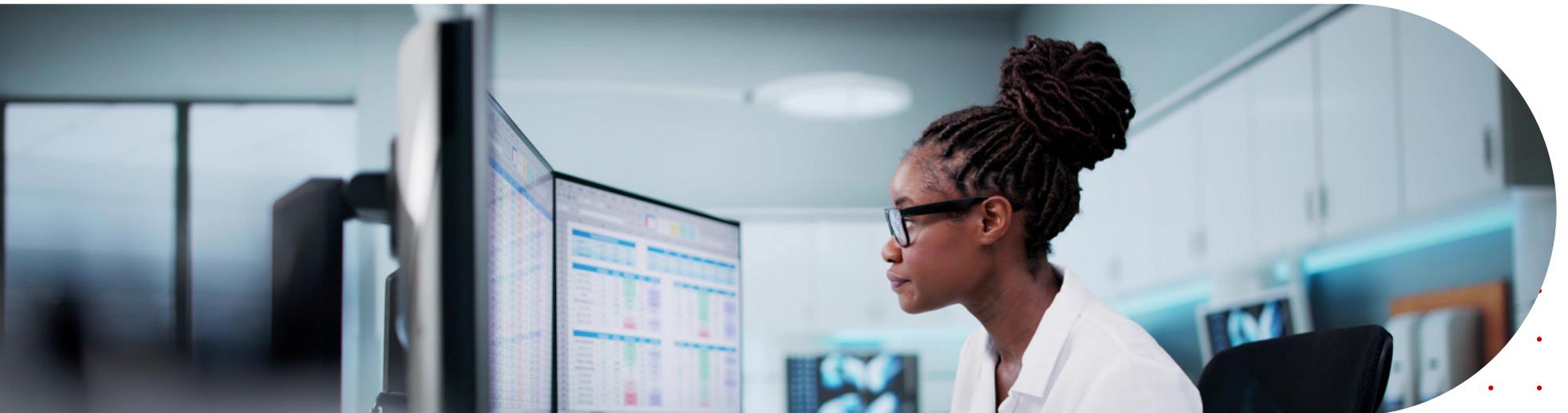
Avoiding Forced Refresh and Hidden Lock-In

A common financial pain point for enterprises is being pushed into refresh cycles that do not align with clinical or business priorities, whether through capacity ceilings, performance limits, or pricing models that penalize growth.

A more sustainable approach like Hitachi's:

- Designs infrastructure with headroom for future workloads, including AI and agentic AI, so that additional demand can be absorbed.

- Supports both high-end and mid-range systems that can be deployed centrally and at the edge.

- Offers flexible consumption and lifecycle services that align costs with value, rather than forcing abrupt capital or operating spikes.

Hitachi's platform is intended to span multiple investment cycles. This means healthcare organizations can avoid the "smartphone effect" where systems are prematurely aged out by design. Instead, they gain a digital core that can evolve with their care models and innovation agenda.
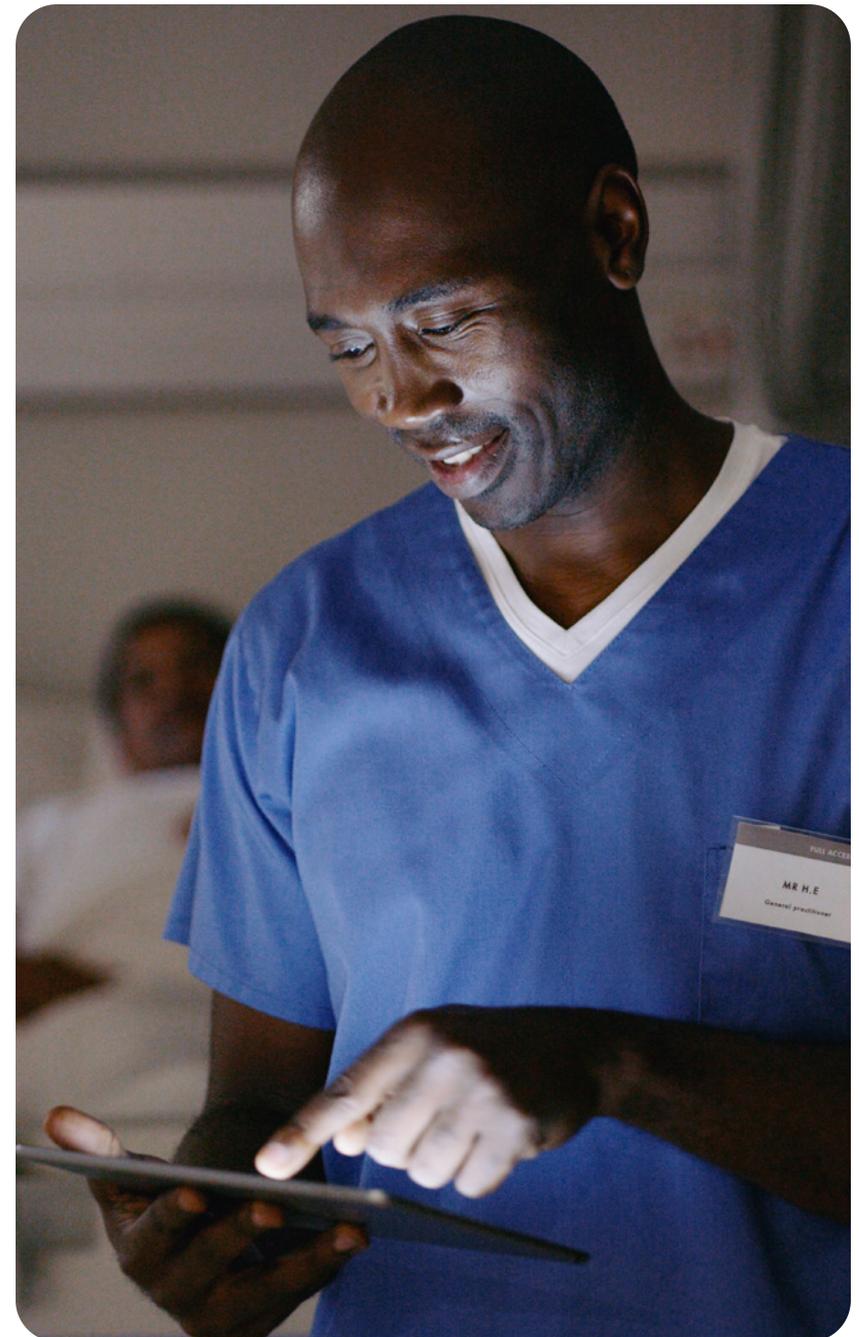
The Human Element

*Consultative Partnership
and Continuous Discovery*

Healthcare environments are too complex, interdependent, and regulated for any single product to be a turnkey solution. Successful transformation requires a combination of architecture, process, and partnership.

Discovery Before Deployment

Hitachi Vantara's work with healthcare organizations begins with discovery, not with hardware. This includes:

- Understanding clinical, operational, and financial objectives.

- Mapping existing systems, data flows, and regulatory constraints.

- Identifying critical applications and their dependencies.

- Assessing current resiliency, backup, and cyber posture.

- Evaluating AI readiness from both infrastructure and governance perspectives.

This consultative approach ensures that modernization plans are tailored, defensible, and sequenced in a way that minimizes risk while maximizing early gains.
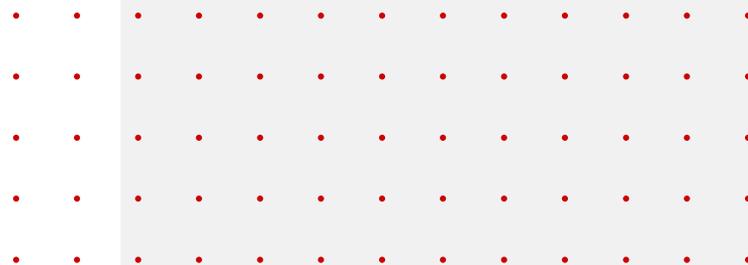
Unified Management and Lifecycle Services

Beyond platforms, healthcare organizations increasingly expect their partners to:

- Provide **centralized management** over hybrid and heterogeneous environments, including non-Hitachi infrastructure and multiple clouds.

- Offer **migration and testing services** that reduce the risk of moving workloads and data between systems.

- Conduct **cyber-resiliency assessments** and help design remediation strategies.

- Support **flexible consumption models** that adapt to evolving business conditions.

This reflects a shift from "box vendor" to strategic enterprise partner that stays engaged across the lifecycle, from planning through implementation and ongoing optimization.

Integrated Capability Across Healthcare and Technology

Hitachi Vantara's depth in healthcare and life sciences, backed by Hitachi's broader heritage in storage, data management, operational technology, and digital engineering, allows it to bridge traditional silos. The same organization that understands hospital operations and smart hospital design also understands advanced storage arrays, AI data pipelines, and national-scale research environments. For healthcare leaders, that integrated capability translates into confidence that modernization initiatives are grounded in both technology and healthcare realities.

Hitachi Vantara

Empowering the Next Generation of Healthcare

Today's healthcare digital infrastructure is just as critical as its physical infrastructure. Resilience, data trust, and intelligent automation will shape not only how care is delivered, but how health systems survive and grow.

The path forward is clear:

- **Modernize the digital core** with hybrid architectures that balance sovereignty, performance, and agility.

- Elevate **data management and governance** as the foundation for every initiative, from compliance to AI.

- Treat **cyber resiliency** as both a clinical and business imperative.

- Build **AI-ready data ecosystems** that can support today's models and tomorrow's agentic AI.

- Choose partners who can provide unified **management, lifecycle support, and integrated expertise**, not just technology.

Hitachi's heritage in healthcare, combined with its strength in infrastructure, analytics, and digital innovation, positions it as a responsible partner for organizations seeking to modernize with confidence. Healthcare leaders do not need incremental change; they need a strategic, durable, and governed foundation.

With the right digital core, that future is within reach.

Learn more about Hitachi Vantara.
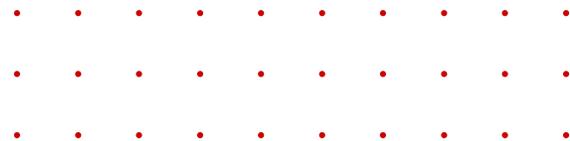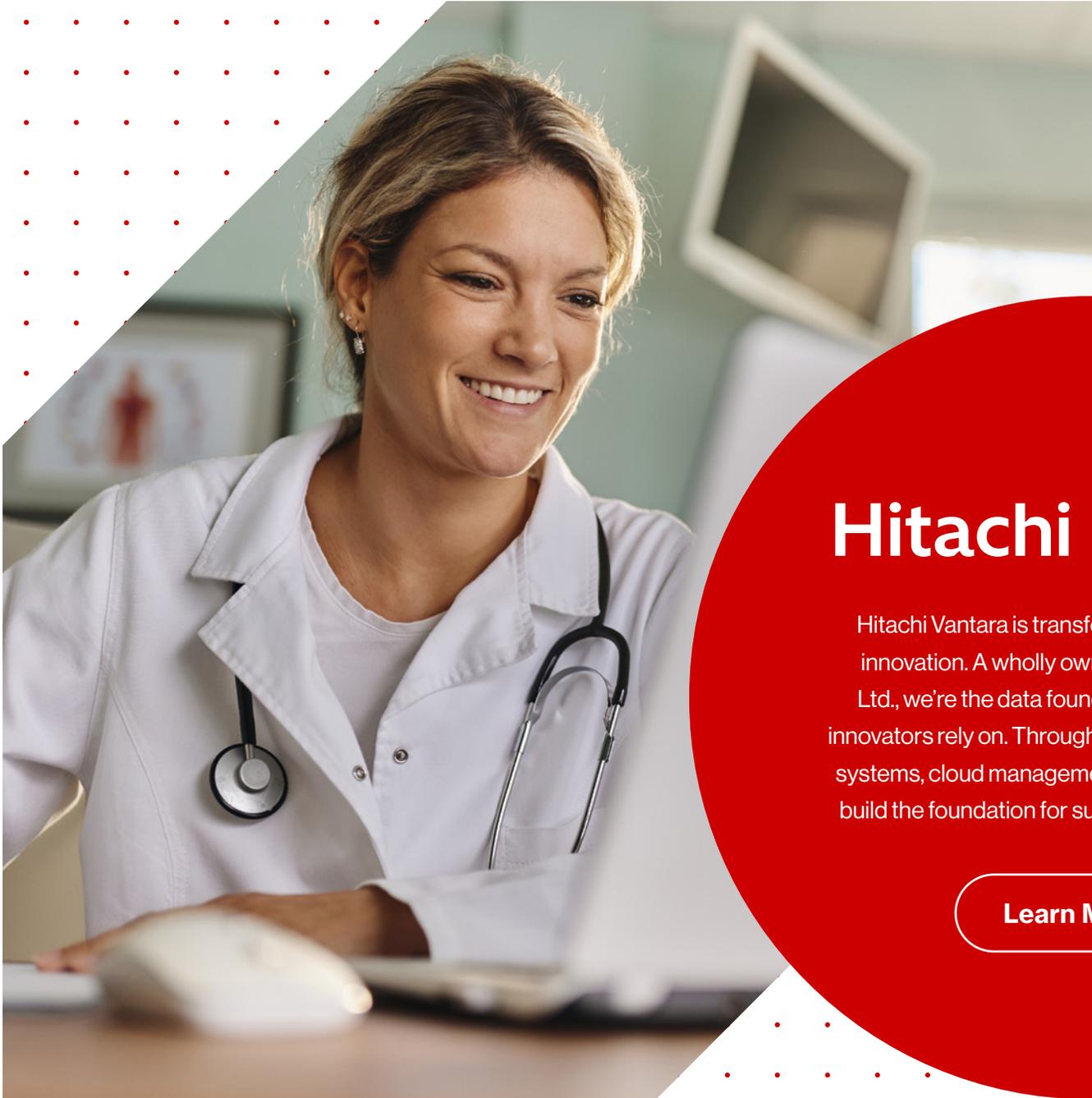
Hitachi Vantara

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.

Learn More →

Studio
by **informa** techtarget •••

Expert led.
Impact driven.

Studio is Informa TechTarget's global content studio offering brands an ROI rich tool kit: Deep industry expertise, first-party audience insights, an editorial approach to brand storytelling, and targeted distribution capabilities. Our trusted in-house content marketers help brands power insights-fueled content programs that nurture prospects and customers from discovery through to purchase, connecting brand to demand.

Learn more