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Oracle's Integrated Approach to Healthcare AI

From experimentation to enterprise impact

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Purpose statement

This document provides an overview of how Oracle enables artificial intelligence (AI) to function as part of everyday healthcare delivery rather than as a separate analytical layer. It is intended solely to help you assess the business benefits of Oracle's integrated approach that connects infrastructure, data, and applications into a unified architecture.

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Introduction

Healthcare has historically not been well served by technology. Compared to industries such as finance, retail, and manufacturing—where digital transformation has driven efficiency, integration, and real-time decision-making—healthcare has lagged in the adoption of modern, connected platforms.

Many organizations still rely on systems designed for narrow, transactional purposes rather than for real-time data access, interoperability, or advanced analytics. As a result, technology investments have often increased complexity rather than reduced it, creating fragmented environments that are difficult to manage and slow to evolve. In a sector defined by high stakes and strict regulatory requirements, this fragmentation has limited the ability of technology to deliver consistent, systemwide impact.

Artificial intelligence (AI) now presents both an opportunity and a risk within this context. On one hand, AI has the potential to improve patient experiences, enhance operational efficiency, and address long-standing challenges such as workforce shortages and rising costs. For example, AI can help identify patients at risk of hospital readmission, support earlier diagnosis of complex conditions, or streamline administrative tasks such as prior authorization and revenue cycle management. On the other hand, if implemented within fragmented and legacy environments, AI risks becoming another expensive layer of investment that increases technology spending without delivering clear or sustainable returns.

Across the healthcare industry, many organizations have already begun to encounter these challenges. AI initiatives are often deployed as stand-alone tools, disconnected from the systems where clinical and operational work occurs. In addition, critical data remains siloed across multiple platforms, stored in inconsistent formats, and is difficult to access in real time.

Oracle's approach

Oracle addresses this challenge through an integrated approach that connects infrastructure, data, and applications into a unified architecture. By embedding AI directly within enterprise systems and enabling access to real-time data, Oracle allows AI to function as part of everyday healthcare delivery rather than as a separate analytical layer.

What distinguishes this approach is not any single capability, but the combination of assets brought together in a unified architecture specifically aligned to healthcare. Few organizations have assembled this breadth of capabilities across infrastructure, data, applications, and industry-specific functionality in a way that is purpose-built for healthcare transformation. This includes not only core technology layers, but also deep investments in healthcare-specific workflows, data models, and interoperability capabilities that allow systems to operate cohesively.

This integrated approach begins with the underlying infrastructure that supports AI at scale. At the foundation is Oracle Cloud Infrastructure (OCI), which provides the computing power and systems needed to run AI at scale. OCI is designed with a strong focus on security from the ground up, incorporating protections similar to those used in highly sensitive government environments. It includes safeguards that help ensure data is kept private, access is tightly controlled, and activity across the system is continuously monitored. These capabilities are especially important in healthcare, where organizations must protect sensitive patient information while meeting strict regulatory requirements.

Beyond foundational security, this architecture places a strong emphasis on observability and transparency across both infrastructure and application layers. At the infrastructure level, OCI provides comprehensive logging, monitoring, and observability capabilities that enable organizations to track access to cloud resources, API activity, and system events. These capabilities create a reliable, tamper-resistant record of how data environments are accessed and managed.

Applications and data platforms within Oracle's healthcare portfolio (including Oracle Health systems and health data platforms) extend this visibility by capturing how data is created, modified, and used within clinical and operational workflows. Together, these layers provide a complete and traceable record of activity, which is

essential for meeting regulatory requirements and maintaining trust in the handling of sensitive healthcare information.

Observability also plays a key role in the responsible use of AI. As AI systems increasingly influence clinical and operational decisions, organizations must be able to understand and explain how those decisions are generated. OCI supports this need by providing the underlying telemetry and infrastructure-level traceability for data access, model deployment, and system interactions.

Building on this foundation, these healthcare application and data platforms capture model inputs, outputs, and decision context, enabling end-to-end traceability of AI-driven processes. This layered approach allows organizations to validate results, investigate anomalies, and enable AI systems to operate within defined governance and compliance frameworks.

Complementing these security and observability capabilities, Oracle's distributed cloud model enables organizations to run the same services across public cloud, dedicated environments, and on-premises deployments. This supports both regulatory compliance and strong security by allowing sensitive data to remain in controlled environments, while still enabling access to advanced AI capabilities.

Building on this secure infrastructure foundation, the Oracle AI database serves as the system of record for enterprise data, securely managing clinical, financial, and operational information with built-in, enterprise-grade security and encryption capabilities. Our databases are built for AI and make data compatibility with AI models faster, easier, and more accurate.

Extending this data foundation further, the Oracle AI Data Platform integrates and standardizes data across systems and enables real-time access. For large healthcare institutions, this can include aggregating data from multiple electronic health record (EHR) systems across acquired hospitals, alongside payer data, claims information, and regulatory data sources such as the Centers for Medicare & Medicaid Services (CMS).

By harmonizing these diverse datasets into a unified model, the platform enables a longitudinal view of patients and operations across the enterprise. It can also incorporate external data sources, such as payer policies and coverage rules, while advanced techniques like semantic enrichment and knowledge graphs allow AI to generate deeper insights; for example, identifying patient risk across care settings, flagging gaps in care, or recommending appropriate follow-up interventions across the continuum.

On top of this robust infrastructure and data foundation, Oracle provides a comprehensive suite of AI infused applications for healthcare institutions, including the EHR, Oracle revenue cycle management, and Oracle Fusion Cloud Applications, which include finance, supply chain, and workforce management solutions. Inside these applications, AI operates within the workflows where decisions are made and actions are taken. This allows organizations to move beyond insight alone and translate intelligence directly into action across clinical, financial, and operational processes.

At the same time, Oracle technology supports an open ecosystem, enabling organizations to build their own AI agents, integrate third-party solutions, and adopt emerging technologies. This flexibility allows healthcare organizations to innovate while maintaining a consistent data and governance foundation, avoiding the trade-offs typically associated with vendor lock-in.

Oracle's long-standing commitment to interoperability further strengthens this model. By enabling secure, standards-based data exchange across providers, payers, and other stakeholders, Oracle supports AI systems that incorporate a broader set of data inputs, improving accuracy and expanding the scope of insights.

Lower costs, higher ROI

Importantly, Oracle's integrated approach also enables healthcare organizations to lower total IT costs over time. By delivering the full technology stack—including infrastructure, database, analytics, and applications—within a unified platform, Oracle reduces the need for complex integrations, duplicate systems, and multiple vendor relationships. Built-in AI capabilities within applications further reduce reliance on third-party tools, minimizing additional licensing, integration, and maintenance costs. This consolidation allows organizations to streamline

operations, simplify architecture, and focus resources on care delivery and innovation rather than system management.

By contrast, many healthcare organizations continue to operate in environments built from standalone products and old technology. These often require organizations to cobble together solutions across multiple vendors. While this approach may offer flexibility in the short term, it frequently leads to higher long-term costs driven by integration, maintenance, and data reconciliation efforts.

Data must be continuously moved, transformed, and aligned across systems, while integrations must be built, monitored, and updated over time. In healthcare, where regulatory requirements, data fragmentation, and legacy systems already contribute to complexity, these challenges are further amplified, increasing both operational burden and financial cost.

Over time, these "cobbled together" architectures can significantly increase total cost of ownership and make it more difficult to scale AI effectively. By contrast, integrated platforms can reduce these burdens by aligning infrastructure, data, and applications within a unified framework, minimizing duplication, simplifying operations, and enabling more efficient deployment and ongoing management of AI capabilities.

Continued reliance on legacy systems, like MUMPS (Massachusetts General Hospital Utility Multi-Programming System) database, further constrain AI adoption because they are not designed for real-time analytics or modern data integration. As a result, organizations struggle to connect the right data to the AI model.

Taken together, these dynamics point to a broader conclusion: artificial intelligence has the potential to transform healthcare but realizing that potential will depend less on the sophistication of models and more on the environments in which they operate. Without modern, integrated foundations, AI risks reinforcing the same fragmentation, cost pressures, and operational inefficiencies that have historically limited the impact of technology in healthcare.

A different path is emerging through modern architecture that brings together infrastructure, data, applications, and governance into a unified system. By aligning these elements, organizations can enable AI to operate in real time, within workflows, and with full context transforming it from a standalone analytical tool into an operational capability. This approach also allows security, compliance, and observability to be embedded directly into the system, ensuring that innovation does not come at the expense of trust or regulatory alignment.

Oracle's holistic approach reflects this shift, demonstrating how integrated platforms can reduce complexity, improve scalability, and create a more sustainable foundation for AI in healthcare. In addition, the comprehensive suite can lower technology investments and deliver a return on investment. By combining flexibility with integration and innovation with governance, this model enables healthcare organizations to move beyond isolated experimentation and toward measurable, enterprise-wide AI impact. Ultimately, the ability to turn data into actionable intelligence—securely, efficiently, and at scale—will define the next phase of healthcare transformation.

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