



Create tomorrow



Application and Modernization for Vantage Health Technologies

Building an AI-Enabled Healthcare Platform

Index

Introduction	01
The Challenge	02
The Solution	03
The Result	04
Lessons Learned	05
The Conclusion	06

Create
tomorrow_



Introduction: **Transforming Healthcare Through AI**



Vantage Health Technologies embarked on an ambitious journey to revolutionize healthcare delivery through an AI-enabled platform built on Microsoft technologies.

Through a comprehensive partnership with Mint Group, they aimed to create a scalable, cloud-native solution that would empower healthcare workers and improve health outcomes globally.

This partnership encompasses both the development of the innovative platform and the ongoing management of the Azure infrastructure through Mint's Managed Services team, ensuring operational excellence and cost optimization.

The Challenge: Creating a Scalable Solution

The healthcare industry faces unprecedented challenges in delivering consistent, high-quality care while managing increasingly complex data and operational requirements. Vantage recognized that addressing these challenges would require more than just a traditional healthcare platform; it would need an intelligent, scalable solution capable of evolving with the industry's needs.

The team faced several critical challenges: processing and analyzing vast amounts of clinical and social determinants data, ensuring seamless integration with existing healthcare systems, maintaining strict security and compliance requirements, and delivering actionable insights to healthcare workers at the point of care. Additionally, the solution needed to scale efficiently while keeping operational costs optimized.



The Solutions: Modern Healthcare Platform

The collaboration between Mint Group and Vantage resulted in a comprehensive cloud-native solution built entirely according to the Microsoft Azure Well-Architected Framework. This framework ensured excellence across five critical pillars: reliability, security, cost optimization, operational efficiency, and performance.

The modern architecture design embraces microservices built using .NET Core, providing the flexibility and maintainability essential for a rapidly evolving healthcare platform. Containerized services enable efficient application management and deployment, while cloud-based API gateways ensure secure and controlled access to the platform's capabilities.

At the heart of the solution lies an advanced data platform that transforms how healthcare organizations handle and analyze information. The multi-stage data pipeline intelligently processes information from multiple sources, including file uploads, API integrations, and SQL extracts. Data flows through Azure databases and transformation pipelines, implementing Kimball methodologies with star schema modeling to ensure optimal performance and accessibility.

The analytics layer leverages Azure analytics services for sophisticated data modeling, enabling healthcare providers to gain deeper insights into patient care and operational efficiency. Through dynamic DAX queries and Power BI integration, the platform delivers powerful visualization capabilities that help healthcare workers make informed decisions quickly.

The entire infrastructure is supported by Mint's Azure Managed Services team, providing comprehensive management of infrastructure, security, and costs. This operational support, detailed in a companion case study, ensures that the platform maintains optimal performance while adhering to strict healthcare compliance requirements.

The Results: AI-Driven Healthcare Platform

The implementation has transformed how healthcare organizations approach patient care and operational efficiency. The platform successfully combines advanced technical capabilities with practical healthcare applications, enabling providers to identify and address health disparities more effectively than ever before.

A notable demonstration of the platform's capabilities and scalability came during the COVID-19 pandemic. The Vantage Community Screening Application rapidly scaled to screen over 1 million people for COVID-19, supporting critical response efforts in the rural areas of Mpumalanga and KwaZulu-Natal provinces in South Africa. This achievement not only highlighted the technical robustness of the platform but also demonstrated its ability to deliver effective healthcare solutions in challenging, remote environments with limited infrastructure.

Healthcare workers now benefit from AI-driven insights delivered through streamlined workflows, supporting everything from risk stratification to referral management. The platform's ability to track patient outcomes and care effectiveness has proven invaluable in improving healthcare delivery and patient experiences.

The technical architecture has demonstrated remarkable performance, with real-time data analysis capabilities and flexible data modeling supporting diverse healthcare needs across different organizations and regions.

Lessons Learned: Following Best Practices

The development journey provided valuable insights into creating successful healthcare technology solutions. Strict adherence to the Microsoft Azure Well-Architected Framework proved essential in building a robust and scalable platform.

The team's iterative development approach, combined with regular architecture reviews, enabled rapid adaptation to changing requirements while maintaining focus on core objectives.

Through the development process, the team gained deep appreciation for the complexities of healthcare workflows and the critical role of data in improving patient outcomes. The importance of building flexible solutions that can adapt to different healthcare scenarios became increasingly apparent as the platform evolved.



Conclusion: Cloud Innovation in Healthcare



Our success in jointly-building the Vantage platform came from embracing an iterative, fail-fast approach. The support and collaboration from the Vantage Health Technologies team was instrumental - they understood that innovation requires experimentation and quick learning cycles. This approach allowed us to rapidly evolve the platform while maintaining focus on our end goal: delivering impactful healthcare solutions.”

- Christo Greeff

Delivery Lead - App Modernisation - Azure **Mint Group**

The development of Vantage’s healthcare platform demonstrates the transformative power of modern cloud architecture in addressing complex industry challenges. While this case study focuses on healthcare, the architectural patterns, development approaches, and cloud-native principles documented here serve as a blueprint for any organization seeking to modernize their solutions using cloud technologies. Whether in healthcare, finance, retail, or any other sector, the lessons learned, and successes achieved provide valuable insights for organizations embarking on their own digital transformation journey.