

FROST & SULLIVAN

GOOGLE CLOUD

2022
TECHNOLOGY
INNOVATION
LEADER

NORTH AMERICAN
HEALTHCARE AND LIFE SCIENCES
CLOUD INDUSTRY

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Google Cloud excels in many of the criteria in the healthcare and life sciences cloud space.

AWARD CRITERIA	
<i>Technology Leverage</i>	<i>Business Impact</i>
Commitment to Innovation	Financial Performance
Commitment to Creativity	Customer Acquisition
Stage Gate Efficiency	Operational Efficiency
Commercialization Success	Growth Potential
Application Diversity	Human Capital

Healthcare and Life Sciences Market Overview

The COVID-19 pandemic highlighted the critical need for healthcare and life sciences organizations to focus on agility, business continuity, and digital transformation. The pandemic also underlined the importance of leading with data and science. Data plays a critical role in advancing clinical research and trials for new vaccines, augmenting telehealth, and reimagining the patient experience while enabling molecular modeling and genomic-based drug development. However, data accessibility is a crucial barrier across the industry. Even if accessible, data is often available in various unstructured modalities, rendering it futile. Therefore, a consolidated approach to derive meaningful insights from disparate patient health data sources is imperative. The lack of automation is another industry challenge. Manual tasks significantly infringe on healthcare providers' time for delivering patient care and life sciences organizations' ability to get critical therapies to market.

Introducing healthcare-specific natural language processing (NLP) and applying artificial intelligence (AI) to the unstructured data corpus can substantially improve operational efficiencies. In addition to interoperability, the system must be secure, scalable, and Health Insurance Portability and Accountability Act (HIPAA)-compliant. The cloud is integral in assisting healthcare providers in responding swiftly to the pandemic needs and preparing for future disruptions. Frost & Sullivan predicts the global healthcare cloud market to grow from \$11.6 billion in 2020 to a massive \$52.3 billion in 2026, increasing at a robust 28.5% compound annual growth rate.

A front-runner in the North American healthcare cloud market, Google's proprietary Google Cloud Platform skillfully innovates technology to tackle the industry's fundamental impediments.

Innovation and Creativity Hub Enhances Operational Efficiency

Founded in 1998 and headquartered in California, the United States (US), Google launched the Google Cloud Platform in April 2008. The platform differentiates itself in the healthcare and life sciences cloud market in several ways.

Imagination

Creativity is a cultural aspect that thrives at Google. The company strives to make significant changes and encourages customers to present them with challenging problems, thus fuelling the employees. It inspires staff members to share ideas and presentations and work together to drive creative thinking. They can participate in "20% projects," projects typically out of their expertise, 20% of their total time, contributing out-of-the-box ideas to spur innovation and creativity. Google has best practices certifications, peer recognitions, and spot bonuses to motivate its members. Moreover, the parent company Alphabet exposes its employees to diverse organizations under its umbrella, such as Google Health, DeepMind, Fitbit, and Isomorphic Labs, providing vast resources to leverage. The company's diversity, equity, and inclusion initiatives also drive diverse perspectives.

Resourcefulness

Google employees use various collaboration tools to connect and work with others, e.g., Google Workspace, Chrome operating system, and secure-by-design Chrome devices. These same tools prove invaluable to the healthcare and life sciences industry as well— whether on the front lines of care, leading research remotely, or keeping operations running smoothly.

State-of-the-art Technology

Google Cloud's Healthcare Data Engine is an interoperable health data engine enabling healthcare organizations to contextualize patient health data from diverse sources into meaningful insights via its industry-leading machine learning and AI capabilities. Google Cloud effectively leverages clinical data from electronic health and medical records to enable a path to better care.

Vision

Alongside Amwell, an American telemedicine company, Google Cloud strives to democratize healthcare access. Its cloud solutions seek to remove distance as a barrier to care, eliminate unnecessary exposure risks, extend specialized care access, save time and money, and combat physician shortage and fatigue.¹ In addition, given the pandemic's dire impact on healthcare organizations worldwide, Google Cloud's Rapid Response Virtual Agent helps build and implement a customized Contact Center AI virtual agent to respond to patient questions on COVID-19 over chat, voice, and social channels.

¹ Esteban López and Cynthia Horner, "How Telehealth Improves Access to Healthcare | Google Cloud Blog," Google (Google, July 13, 2021), <https://cloud.google.com/blog/topics/healthcare-life-sciences/how-telehealth-improves-access-to-healthcare>.

Today, healthcare and life sciences leaders can more effectively make real-time decisions around population health, resource utilization, optimizing clinical trials and accelerating research, identifying high-risk patients, and other critical needs with health insights.

The Google Cloud Platform supports Fast Healthcare Interoperability Resources, Health Level Seven International, and Digital Imaging and Communications in Medicine standards. It helps healthcare providers, payers, and life science companies gather de-identified data and deliver greater insight for their products, drugs, and therapies across the value chain for outcome-based scenarios. Additionally, the interoperable platform allows easy access for various devices, enabling virtual care. Moreover, Google Cloud's platform ensures a circular information flow from payers to providers, optimizing approval times and increasing speed to care, thus advancing healthcare and analytics through automation. Reportedly, it can now streamline data processing, reducing the total time from six to 12 months to an incredible six to 12 weeks.²

"Instead of spending 75% of our time dealing with architecting the underlying platforms, we spend 75% of our time focused on higher-value use cases for clinicians and patients. Google Cloud's Healthcare solutions have greatly improved our developer productivity and time to value."

-Nic Lorenzen, Director of Software Engineering and Architecture, Emerging Technology & Innovation, Northwell Health³

Furthermore, Google Cloud's zero-trust access model BeyondCorp shifts access controls from the network perimeter to individual users' interactions with applications and services, enabling secure work from any location without using traditional virtual private networks.

Companies look to Google Cloud for its "secure-by-design" approach to addressing the security, privacy, and compliance aspects of bringing healthcare technology solutions to life. One example includes Highmark.

"Google Cloud takes security more seriously than the other providers we considered, which is very important to an organization like us. Cloud applications and infrastructure for healthcare must be secure and compliant."

Highmark Vice President and Chief Information Security Officer, Omar Khawaja⁴

Focusing on data privacy and security, Google Cloud emphasizes to its partners the conditions under which it can access their data and encrypt customer data at rest and in motion. Finally, the Google Cloud Platform also provides a functional omnichannel experience, so far missing in the industry. The company enables organizations to synthesize information enterprise-wide in an intelligent data layer and leverage the Healthcare Data Engine for insights that ultimately impact patient lives. Google Cloud has made tremendous advancements in customizing and personalizing patient experiences.

² Google Cloud Briefing.

³ Bob Lou and Nic Lorenzen, "How Northwell Health Saves Time and Lives with Google Cloud | Google Cloud Blog," Google (Google, November 1, 2021), <https://cloud.google.com/blog/topics/healthcare-life-sciences/how-northwell-health-saves-time-and-lives-with-google-cloud>.

⁴ Omar Khawaja and Amy Waldron, "Highmark Is Using Google Cloud Services for Secure-by-Design | Google Cloud Blog," Google (Google, January 20, 2022), <https://cloud.google.com/blog/topics/healthcare-life-sciences/highmark-is-using-google-cloud-services-for-secure-by-design>.

“Frost & Sullivan commends Google Cloud for introducing a cloud platform that skillfully overcomes relevant industry challenges and optimizes operational efficiency by masterfully leveraging creativity and cutting-edge technology.”

- Ojaswi Rana, Best Practices Research Analyst

In life sciences and research organizations, institutions like Harvard Global Health Institute and Schrodinger found ways to accelerate insights and discovery to move the industry forward while running simulations remotely and collaborating as a distributed workforce.

Frost & Sullivan commends Google Cloud for introducing a cloud platform that skillfully overcomes relevant industry challenges and optimizes operational efficiency by masterfully leveraging creativity and cutting-edge technology.

Application Diversity Guarantees High Customer Acquisition and Commercialization Success

Clinicians and researchers utilize the Google Cloud Platform across specialties and indications. Examples include dermatological imaging for psoriasis to detect skin cancer and optometry to identify diabetic retinopathy. It is also popular in chronic care management and value-based care in the digital care space. Payers and providers leverage the platform for prior authorization and claims modernization. The

Google Cloud Platform also features inpatient tracking and patient-enabled data capture in the wellness and telehealth space. It monitors and stores longitudinal health data and streamlines wearable and in-home device data. Finally, the COVID-19 pandemic spurred Google Workspace adoption by people working from home.

Kaggle, a data science Google subsidiary, uses the Google Cloud Platform to understand COVID-19 better. It allows users to find answers to their questions from the scientific literature by using NLP; forecasts COVID-19 cases and fatalities, and supports frontline responders by answering research questions through exploratory analysis.⁵

Moreover, the Hospital Corporation of America (HCA), one of the leading healthcare service providers in the US, uses Google Cloud solutions to improve COVID-19 responses. Powering HCA’s National Response Portal (established in only eight weeks), its solutions: provide COVID-19 analytics for more than 3,100 US counties, increase impartial accessibility, deliver COVID-19 data insights for one million users simultaneously, generate 30,000 new analytical views per day, reveal insights and trends for every US state and county, and enable forecasting models for resource allocation needs and future community hot spots.

“Rapid, reliable access to data is critical. We needed to improve how people could capture and share data, which was proving to be a challenge. We decided to build a centralized data portal called the National Response Portal (NRP) for healthcare providers.”

-Dr. Edmund Jackson, Chief Data Officer, HCA Healthcare⁶

⁵ Kaggle, “Help Us Better Understand Covid-19,” Kaggle, 2021, <https://www.kaggle.com/covid19/>.

⁶ Google, “HCA Healthcare Case Study | Google Cloud,” Google (Google, 2021), <https://cloud.google.com/customers/hca?hl=en>.

The Google Cloud Platform aligns with data analytics, data interoperability, and security with HIPPA, HITRUST CSF, generic good practice, International Organization for Standardization (ISO)/Importer-Exporter Code (IEC) 27001, and ISO/IEC 27018 certifications.

“Frost & Sullivan believes Google Cloud demonstrates immense growth potential, attracting an extensive customer base through its comprehensive product portfolio.”

- Ojaswi Rana, Best Practices Research Analyst

The cloud solution witnesses remarkable adoption and growth in healthcare and life sciences. Google Cloud partners with organizations such as Highmark, the Mayo Clinic, HCA, Amwell, and non-healthcare companies like Deutsche Bank and TELUS. The company expects more than doubling its business performance in 2021 compared to 2020. Mainly, it foresees robust growth in telehealth and virtual care, remote work, and healthcare data interoperability.

Google Cloud identifies pharmaceuticals and genomics as promising growth areas. It has some leading products and partnerships in this space that validate its experience and thought leadership around linking AI and drug discovery and development. One such example includes bio-pharma organizations leveraging the groundbreaking protein folding system, AlphaFold, with Google Cloud’s Vertex AI.⁷

Frost & Sullivan believes Google Cloud demonstrates immense growth potential, attracting an extensive customer base through its comprehensive product portfolio.

Conclusion

The healthcare and life sciences industry faces several challenges, including a lack of access to insights from health data, especially structured patient data. Automation and security are also major problems in the sector. Google’s proprietary Google Cloud Platform expertly transcends these obstacles by offering the Healthcare Data Engine that contextualizes disorganized data from different modalities to provide vital insights. Surrounding this platform, the company’s industry-standard healthcare-specific natural language processing and artificial intelligence are incredibly efficient operationally. The Google Cloud Platform also ensures top-notch data privacy and security. Leveraging state-of-the-art technology and cultivating a unique culture of creativity, Google Cloud offers a range of healthcare cloud platform offerings that attract diverse customers. Achieving admirable commercialization success, the Google Cloud Platform indicates promising growth potential.

For its commitment to creativity and innovation and excellent offerings, Google Cloud earns Frost & Sullivan’s 2022 Technology Innovation Leadership Award in the North America healthcare and life sciences cloud market.

⁷ Shweta Maniar, “Bio-Pharma Organizations Can Now Leverage the Groundbreaking Protein Folding System, AlphaFold, with Vertex AI,” Google (Google, January 21, 2022), <https://cloud.google.com/blog/products/ai-machine-learning/running-alphafold-on-vertexai>.

What You Need to Know about the Technology Innovation Leadership Recognition

Frost & Sullivan's Technology Innovation Leadership Award recognizes the company that has introduced the best underlying technology for achieving remarkable product and customer success while driving future business value.

Best Practices Award Analysis

For the Technology Innovation Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Technology Leverage

Commitment to Innovation: Continuous emerging technology adoption and creation enables new product development and enhances product performance

Commitment to Creativity: Company leverages technology advancements to push the limits of form and function in the pursuit of white space innovation

Stage Gate Efficiency: Technology adoption enhances the stage gate process for launching new products and solutions

Commercialization Success: Company displays a proven track record of taking new technologies to market with a high success rate

Application Diversity: Company develops and/or integrates technology that serves multiple applications and multiple environments

Business Impact

Financial Performance: Strong overall financial performance is achieved in terms of revenues, revenue growth, operating margin, and other key financial metrics

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Commitment to quality and to customers characterize the company culture, which in turn enhances employee morale and retention

