



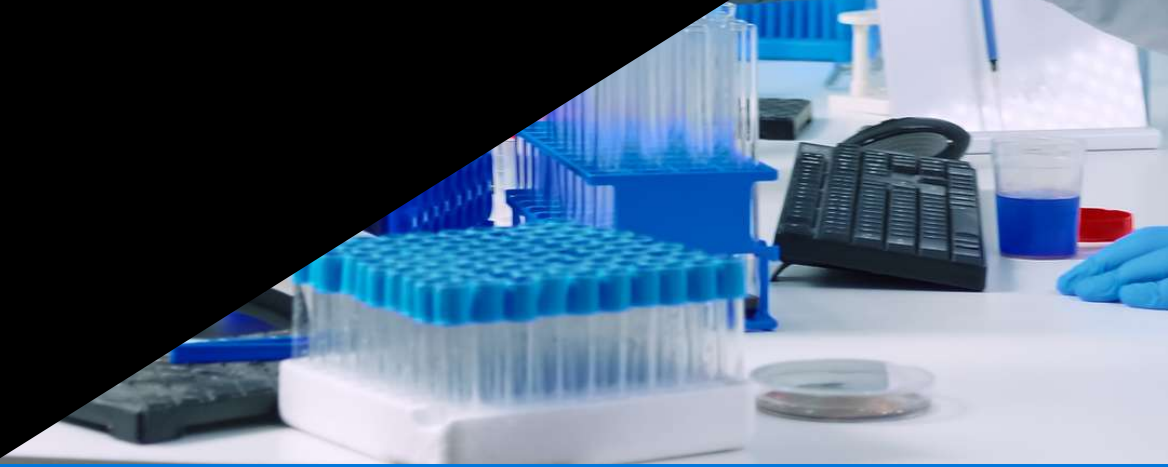
Life Sciences and Healthcare Industry

GLOBAL AI ADOPTION REPORT 2022

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A Bespoke Global AI Advisory & Consulting Firm



The Global Artificial Intelligence (AI) in Life Sciences market size was valued at US\$ 1.3 billion in 2021 and it is expected to reach around US\$ 6.7 billion by 2030 with a registered CAGR of 20% from 2022 to 2030.

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Overview

Artificial intelligence (AI) in varying forms and degrees, has begun to get adopted in multiple interfaces and areas, from the phones we use to communicate to the supply chains that bring goods to market. It is transforming the way we interact, consume information and buy products and services. Healthcare and Life Sciences are no exception. In Healthcare, the impact of AI, through natural language processing (NLP) and machine learning (ML), is transforming care deliver and other parts of value chain. Today, algorithms are already outperforming radiologists at spotting malignant tumours, and guiding researchers in how to construct cohorts for costly clinical trials. However, it will be many years before AI replaces humans for broad medical process domains.

The field of drug design always seeks a holistic approach, in which it focuses on not only the disease, but also the patient's body and mind. Therefore, pharmaceutical research on new AI technologies has received substantial attention in recent decades, because learning architectures have shown more accurate results in predicting properties, which is currently indispensable.

Data and intelligence are powering a new age of research and discovery that will help us develop treatments faster and reduce the high costs associated with work in the life sciences. In doing so, they will help make a more fair and accessible healthcare system, while increasing the health and happiness of everyone.

AI is making a difference in the way care is provided, improving both the caregiver and the patient experience. AI and ML-based technologies are aiding digital healthcare in bringing a positive change in the lives of people, especially at a time when the world is in recovery mode after a devastating pandemic. In fact, the digital health platform is also helping companies in the healthcare sector on their AI and data journey.



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Growth opportunities are hard to come by without significant investment, but one significant opportunity is a self-running engine for growth in healthcare and life sciences: artificial intelligence (AI). AI is Healthcare's New Nervous System.

- AI is used in healthcare for approximation of human cognition and analysis of complex medical and diagnostic imaging data.
- Artificial intelligence is primarily used in healthcare to analyse the relationship between treatment techniques and patient outcomes.
- AI programs are deployed in medical practices such as diagnostic processes, drug development, personalized medicines, and patient monitoring care. For instance, AI could aid in clinical processes by checking the vital signs, asking questions, and giving prescriptions to the patients.
- AI can also be used for alerts and reminders, image interpretation, information retrieval, and therapy planning during medical procedures.
- Deep learning is used for image recognition, signal recognition, and data mining and is the most widely used form of AI.

At hyper-speed, AI is re-wiring our modern conception of healthcare delivery. AI in health represents a collection of multiple technologies enabling machines to sense, comprehend, act and learn, so they can perform administrative and clinical healthcare functions. Unlike legacy technologies that are only algorithms / tools that complement a human, health AI today can truly augment human activity—taking over tasks that range from medical imaging to risk analysis to diagnosing health conditions.

Although the industry is advancing with AI, there are still some stern challenges to look towards. The lack of data, compromise in data integrity, infrastructure, regulations, recruitment of new skill and talent, etc. are some of the issues that still need to be addressed.

The global AI in the healthcare market is expected to reach a market size of USD 215.53 billion by 2030 and register a substantially high CAGR over the forecast period





Business Value Chain: AI Adoption Areas

1. Patient Care and Outcomes
2. Clinical Trials
3. Research and Development
4. Production and Manufacturing
5. Accounting and Finance
6. Sales and Marketing
7. Supply Chain Optimization
8. Regulatory and Industry Compliance
9. Advancing Diagnostics
10. Accelerating Drug Development
11. Optimizing Submission Dates
12. Electronic Health Records
13. Patient Data Analytics
14. Operations
15. Cyber Security
16. Early Diagnosis
17. Gene Analysis and Editing
18. Real-time Prioritization and Triage

1. Patient care and outcomes

With AI-powered insights, Life Sciences firms can become truly patient-centric. It allows pharmaceutical companies, medical device manufacturers, HCPs and insurers to more closely align their goals with those of their patient to develop preventative and outcome-related approaches. By accessing and analyzing data from disparate sources, such as EMRs, clinical trial data and social channels, companies can deliver deeper medical insights to healthcare professionals and direct to the patient.

Sensely is an avatar-based, empathy-driven platform that leverages natural user interfaces to intelligently connect insurance plan members with advice and services. By utilizing Sensely's scalable platform technology architecture, insurance companies can converse with their members in an entirely new way, combining the empathy of human conversation with the efficiency and scalability of technology.

2. Clinical trials

Clinical trial planning and design can benefit from AI-powered analytics, especially within trial recruitment and enrollment. Using data from previous trials and comparable trials as well as patient and EMR data, allows for more accurate patient profiling and identification. It will help clinical study teams better estimate the time needed to recruit the required number of trial subjects.



3. Research and development

For Life Sciences organizations, clinical trials are often the largest part of any R&D budget. Using AI-powered insights, organizations can better analyze the results of clinical trials and patient records to identify follow-on indications and discover adverse effects before products reach the market. In addition, AI deliver insights from data that were simply not available before.

Gilead Sciences is an American biotechnology company that researches, develops, and commercializes drugs. The company is using an AI-platform of insitro to discover and develop treatments for nonalcoholic steatohepatitis (NASH). By introducing data-driven discovery and development, the company will transform the way that drugs are discovered and delivered to patients.

4. Production and manufacturing

As with any other manufacturing operation, Life Sciences manufacturers need to ensure optimum capacity for their production facilities. However, when patient safety is concerned, quality management becomes a major issue. Deploying AI allows for the close management of the production process as well as managing through risk to minimize the chance of impurities in a formulated drug product.

5. Accounting and finance

Accounting and finance departments can apply AI to improve their cash-based processes. In addition, it can accelerate payments by automatically validating and processing invoices, allowing the accounts payable department to secure early payment discounts. When errors occur, the system can react automatically or suggest resolution options to accounts payable staff.

6. Sales and marketing

Pharmaceutical firms can leverage AI to improve sales forecasting by analyzing previous sales activity, customer purchasing patterns, market sentiment, competitor pricing and demographic sales trends to provide highly accurate pictures of future sales opportunities. In addition, digital marketing can apply AI to fully understand customer perceptions about their products, which channels are most likely to convert and which marketing campaigns deliver the most return. For example: Aktana offers the Decision Support Engine, which it claims can help pharmaceutical companies provide their sales and marketing representatives with relevant information and suggested actions on how to engage with target healthcare professionals and healthcare organizations using machine learning.



7. Supply chain optimization

Life Sciences companies are increasingly involved in extended partner ecosystems, working closely with CROs, suppliers, customers, academic bodies and regulators. AI can help improve supply chain automation and visibility. It allows for real-time management of supplier relationships and performance, as well as improved contingency planning and business continuity. It can use a combination of internal and external data to help reduce unforeseen shortages and supply chain disruptions affecting customer service levels and sales revenues.

Owkin combines life-science and machine learning expertise to make drug development and clinical trial design more targeted and more cost effective. Owkin's machine learning algorithms create models that predict disease evolution and treatment outcomes. These predictive models are used for enhanced analysis, surrogate endpoints, patient stratification and selection, and subgroup identification. The impact of this research is faster discovery of better treatments at a lower cost.

8. Regulatory and industry compliance

Healthcare reform, changing regulatory requirements and globalization have all added to the compliance and risk burden for every Life Sciences organization. AI eases the discovery and retrieval process by mining all data, structured and unstructured, to drive risk planning through the early detection of anomalies and exceptions that may fall outside of compliance requirements. Within pharmacovigilance, for example, real-world patient data can be integrated with EMR data to minimize risk and improve drug safety.

Subtle Medical has developed a suite of deep learning software solutions that enhance images during the acquisition phase of the radiology workflow, improving workflow efficiency and patient experience. SubtleMR and SubtlePET, both FDA cleared and CE Mark approved, utilize deep learning algorithms that integrate seamlessly with any scanner and PACS system with no change in the imaging specialists' workflow. SubtlePET and SubtleMR bring the latest imaging enhancement technology to existing scanners.



9. Advancing Diagnostics

Histopathology image analysis and automated diagnosis were ripe for AI, given the technological progress in digitalization of complete histology slides, which permit all microscopic magnifications. AI and pattern recognition, combined with complex algorithms and automated immunohistochemical measurement systems, have advanced pathologists' ability to oversee the analysis and concentrate on more-difficult cases.

Agilent Technologies recently announced a partnership with an AI software company, in order to work together on the quality and standardization of tissue diagnostics. The companies' shared goal is to provide specific technologies, products, and services that will improve the standardization of pathology labs and accelerate accurate diagnostics.

10. Accelerating Drug Development

Across the industry, product development timelines range from seven to ten years from discovery to launch, with sights set on reducing them to five to seven years. Advancements in AI and machine learning to reduce the time it takes to develop, manufacture, and launch new patient therapies support the goal of reducing overall product development timelines.

A Biopharma company, NuMedii has built a technology, AIDD (Artificial Intelligence for Drug Discovery), that harnesses Big Data and AI to rapidly discover connections between drugs and diseases at a systems level.

11. Optimizing Submission Dates

Life sciences companies are responsible for up-to-date information on the safety of their products. Pharmaceutical labels are an important way to communicate safety information. When an update to the reference label is necessary for safety reasons, there are multiple considerations for submitting the local product label to the corresponding health authority. Combining and connecting the appropriate data points with machine learning and predictive analytics can determine an optimal submission date.

Binah.ai; It is shaping the future of Artificial Intelligence (AI) by simplifying and accelerating AI adoption with our world-leading expertise in machine and deep learning, signal processing and AI, addressing high-value problems in multiple Industries. Binah.ai has released a series of non-invasive, video-based health and wellness monitoring solutions. Binah.ai gives an unparalleled advantage in health analytics as its technology transforms any device equipped with a simple camera into a medical-grade healthcare gadget. The video-based digital health use cases include heart rate and heart rate variability (HRV) measurements, providing the data for stress measurements.



12. Electronic Health Records

Support vector machines (technologies for sorting patient email queries) and optical character recognition (a technology for digitizing handwritten notes) are essential components of machine learning systems for document classification. Examples of these technologies are MathWorks' MATLAB (a machine learning tool that has handwriting recognition applications) and Google's Cloud Vision API.

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13. Patient Data Analytics

AI helps to analyze patient and/or third party data to discover insights and suggest actions. AI allows the institution (hospital, etc.) to analyze clinical data and generate deep insights into patient health. It provides an opportunity to reduce cost of care, use efficiently resource and manage population health easily. For example, Zakipoint Health displays all the relevant healthcare data at a member level on a dashboard to understand risk and cost, provide tailored programs and improve patient engagement.

14. Operations

Process automation technologies such as intelligent automation and RPA help hospitals automate routine front office and back office operations such as reporting.

Remedy Health's AI-assisted platform equips non-physician staff with clinical expertise to uncover hidden chronic diseases through phone screening interviews. Early diagnosis allows them to find the best fulcrum point for intervention to positively affect health outcomes and decrease cost. Finding undiagnosed patients will also drastically increase a health system's RAF scores and profitability.



15. Cyber security

Hospitals and clinics hold a lot of confidential information. This information needs protection from cyber-attacks. Even the smallest data leak can cause significant harm to both patients as well as healthcare professionals. It might not be possible for the hospitals' cybersecurity teams to figure out every potential threat to their systems. AI can help cybersecurity teams to figure out every potential issue or risk. The algorithm can also rank them based on their priority and present it to the team.

16. Early diagnosis

AI helps to analyze chronic conditions leveraging lab data and other medical data to enable early diagnosis. For example, Amara Health Analytics provides real-time predictive analytics to support clinicians in the early detection of critical disease states.

17. Gene analysis and editing

AI helps to understand gene and its component, as well as predict the impact of gene edits. For example, Desktop Genetics is an international biotechnology company to help researchers discover and treat the root genetic causes of human disease.

Vertex is a global biotechnology company that invests in scientific innovation to create transformative medicines for people with serious and life-threatening diseases. In 2018, Vertex Pharmaceuticals announced a three-year collaboration, to use human genetics and Machine Learning to improve discovery of targets of precision medicine, and to understand better the clinical impact of human genetic variation and patient stratification in diseases with unmet need

18. Real-time prioritization and triage

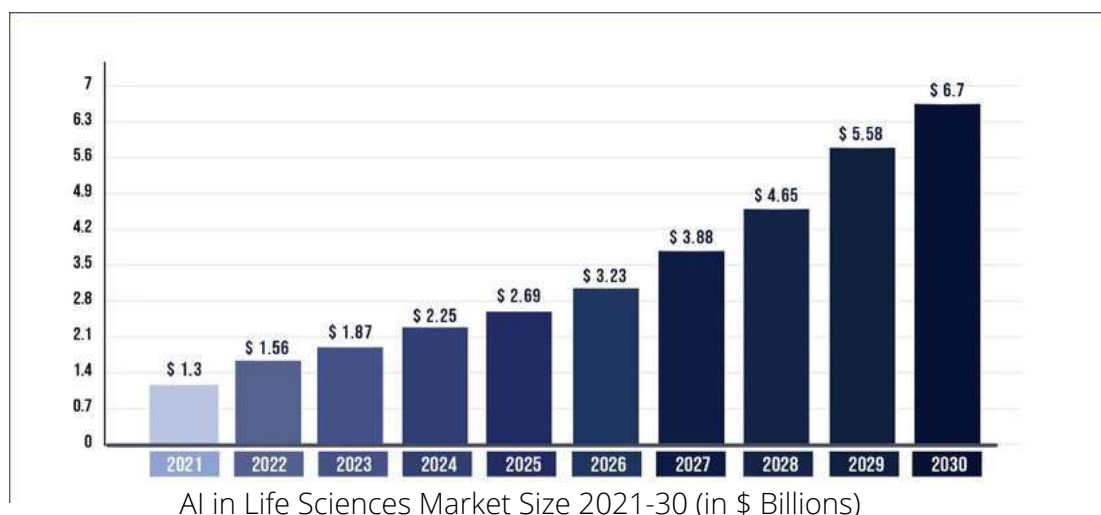
Prescriptive analytics on patient data enables accurate real-time case prioritization and triage. For example, Enlitic provides Patient triaging solutions scan the incoming cases for multiple clinical findings, determine their priority, and route them to the most appropriate doctor in the network.

BioSymetrics. Traditional ML technologies are incompatible with biomedical raw data formats, and there are few standards for data standardization, normalization, and harmonization. BioSymetrics solves this problem by deploying its primary solution, Augusta, which is a pre-processing and analytics platform that can process large amounts of data (siloes and raw data) for predictive analytics. This is useful for capturing the exabytes of data released from the 25B IoT devices and other biomedical data types (EEG, MRI and others) and deriving actionable insights from them. The customized and flexible tool can be used for scientists, providers, hospitals, biopharmaceutical companies.



Spending on AI

The global artificial intelligence (AI) in life sciences market size was valued at US\$ 1.3 billion in 2021 and it is expected to reach around US\$ 6.7 billion by 2030 with a registered CAGR of 20% from 2022 to 2030.



Global spending on AI in Healthcare is forecasted to exceed \$36 billion by 2025.

- Transformative AI healthcare trends anchoring this forecast include the AI combined with data analytics, genomics, electronic medical records, and wearables that are predicted to drive personalized medicine and deliver improved patient care so patients can be diagnosed and treated earlier and more accurately.
- Robotic surgery is one of the main potential areas of investor focus in 2020, alongside AI-enabled devices, while in the more classic medical device segment, the robotic surgery market is expected to continue to attract M&A interest.
- As AI and robotic process automation are more widely deployed, they will help re-humanize medicine by allowing doctors to focus less on paperwork and administrative functions, and more on patient care.
- When it comes to home health and hospice care, potential investors are looking for firms that provide a spectrum of services across nonmedical home care that range from activities of daily living and basic home healthcare for the transitional period after a hospital or rehab stay, all the way to home hospice scenarios.
- The massive presence of pharmaceutical companies and the global demand for US pharmaceutical exports are increasingly motivating companies to invest in R&D activities.

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- Owing to such research activity, many pharmaceuticals companies, such as Pfizer and Johnson & Johnson, and several clinical research organizations in the country, are increasingly spending on AI solutions.
- Companies, like Pfizer, despite collaborating with several AI vendors, are also investing in in-house AI operations to support several drug discovery and patient monitoring processes.

Few examples of spending & application by Healthcare & Life Sciences organizations on AI are given as follows: -

- **Arcadia.io (Boston):** Arcadia.io's AI and machine learning capabilities augment their leading data aggregation platform. Through these capabilities, Arcadia enables healthcare organizations to create complex predictive analytics algorithms to better identify patients who are rising risks for overutilization so that healthcare providers can proactively implement interventions.
- **Aidoc (Tel Aviv, Israel):** Aidoc provides radiologists with artificial intelligence (AI) for clinical settings. Their FDA cleared solution detects time-sensitive pathologies and prioritizes them in the radiology workflow, allowing leading health systems to improve outcomes and patient safety.
- **AiCure (New York City):** AiCure is an AI and advanced data analytics company that uses video, audio and behavioural data to better understand the connection between patients, disease and treatment. It allows physicians to have access to clinical and patient insights.
- **Babylon Health (London):** Babylon is a digital healthcare provider that aims to create an internationally accessible and affordable health system for all.
- **CloudMedx (Palo Alto, California):** CloudMedx uses AI, data-driven models to improve clinical insights, revenue cycle management and patient care.
- **Healint (Singapore):** Healint designed the leading migraine application, Migraine Buddy, which tracks users' migraines, understands triggers and shares migraine history with physicians to better treat and efficiently improve the invisible pain.
- **InformAI (Houston):** InformAI develops AI healthcare applications that improve physician productivity and speed up medical diagnosis at the point-of-care. The company's applications use artificial intelligence to both interpret 3D imaging modalities and assess patient procedure risks to assist physicians in their treatment planning for targeted medical conditions.

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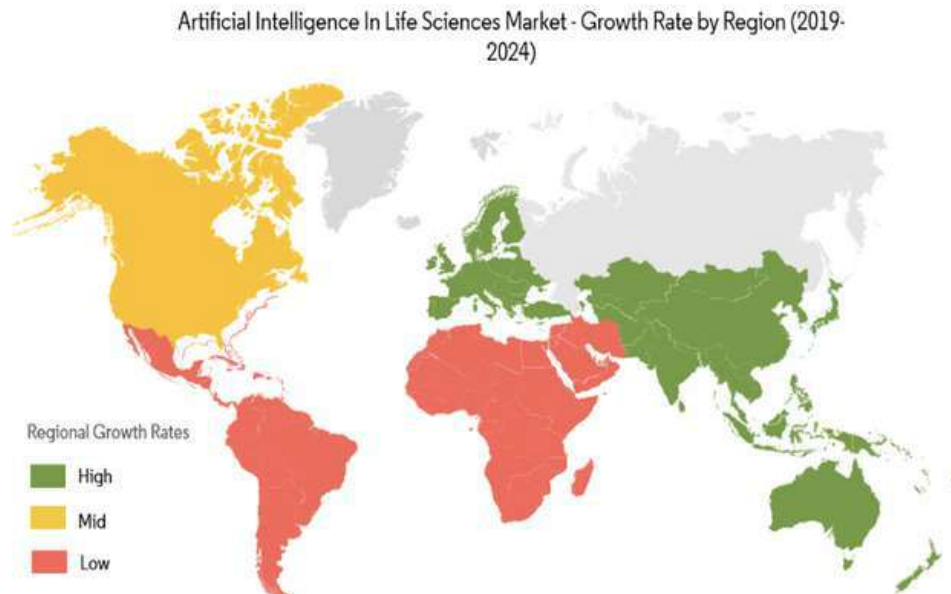


- **Linguamatics, an IQVIA company (Boston).** Linguamatics delivers NLP-based AI solutions for high-value knowledge discovery and decision support from text. Their solution empowers customers to speed up drug development and improve patient outcomes by breaking down data silos, boosting innovation, enhancing quality, and reducing risk and complexity.
- **Touchkin (Bengaluru, India).** Touchkin's Wysa is a pioneer AI-driven empathetic, compassionate conversation coach that instantly helps users improve their mental health.
- **Viz.ai (San Francisco).** Viz.ai uses AI-powered products to synchronize stroke care and improve access to life-saving therapies. It detects and alerts stroke teams and allows them to communicate in real time.

The medical technology space, which includes precision medicine, robotics and smart wearables, is expected to continue to grow at a pace of more than 5% per year, with annual sales worldwide expected to reach \$800 billion by 2030.



AI Adoption across Regions



Source: Mordor Intelligence

- Asia Pacific is the fastest growing market owing to the huge untapped opportunity in this region.
- The US commands the largest share in global AI in the healthcare market owing to the increasing adoption and awareness about AI technology.
- Rising adoption of healthcare IT solutions, well-established healthcare sector, and availability of funding for developing AI capabilities are some of the factors contributing to the growth of the market in the region.
- Advancements in technology and several government initiatives are aiding adoption of digital platforms in life sciences, which can also be attributed to this share.
- Improving infrastructure for healthcare IT, rising number of AI start-ups, and gradually increasing adoption of advanced technologies are some of the factors contributing to market growth.
- Rise in number of government initiatives for AI technology in this region is also expected to support growth.



AI Adoption across US

- **Aiva Health**

Aiva Health developed Aiva, the first voice-powered care assistant. The software understands requests and instantly connects patients with the correct physician for communication.

- **Belong.life**

Belong's end-to-end patient engagement platform (PEP) for payers, providers, pharma and advocacy groups utilizes AI and machine learning to deliver hyper-personalized patient experiences. Additionally, the Belong "Beating Cancer Together" app unites 200,000 global cancer patients, caregivers and healthcare professionals, delivering AI-powered personalized news, peer support, direct access to doctors, clinical trial matching services and document management tools.

- **Cardinal Analytix Solutions**

Cardinal Analytix Solutions, an artificial intelligence-enabled health insights company, helps organizations predict and identify future health risks, improve patient outcomes and costs and develop an action plan for reducing such determinants.

- **DeepRadiology**

DeepRadiology provides tools for identifying indications in multiple modalities to prioritize studies and patients for the most efficient care.

- **FDNA**

FDNA uses artificial intelligence to analyze genetic, phenotypic information databases to detect physiological patterns that reveal disease-causing genetic variations.



- **FitGenie**

FitGenie is an AI, nutrition application that aids people by providing tools and instructions for maintaining and optimizing nutritional health. More specifically, it is a smart calorie counter that tells users what to eat to reach their goals.

- **Innovaccer**

Innovaccer is a healthcare data activation company that works to improve care delivery by making full use of all the data the healthcare industry has collected.

- **Medicomp Systems**

Medicomp Systems uses AI technology to transform structured and unstructured healthcare data into clinically relevant, patient-specific data at the point of care for better decision-making and to feed data to clinical dashboards and analytics systems.

- **SmartPlate**

SmartPlate is the first intelligent wellbeing platform that uses advanced photo recognition and AI technology to identify, weigh and analyze anything users eat. The device instantly tracks calories by using a mobile application and a smart plate.

- **twoXAR**

twoXAR is an artificial intelligence-driven drug discovery company that uses its platforms to identify promising drug candidates, de-risk opportunities and progress drug candidates to clinics.



AI Adoption across Europe

- **Aidence**

Aidence has developed Veye Chest, the AI application improving diagnostics for the treatment of lung cancer. Veye Chest helps radiologists by automatically detecting, quantifying and reporting on lung nodules present on CT-scans, empowering physicians to make a diagnosis based on guideline-driven measurements.

- **Optasia**

Optasia's algorithm looks through thousands of existing CT scans already held by NHS Trusts, quickly identifies vertebral fragility fractures (VFFs) and returns the scan to the hospital with the fractures clearly 'flagged up' for further investigation. In doing so, it also frees up valuable time for specialist doctors to use their expertise and skills where they are needed most.

- **Ada Health**

Ada Health is a German company that offers a smartphone chatbot called Ada, which the company claims can help patients manage their personal health. The company also claims that the application could help community health workers support rural patients by providing health information and keeping patient records using machine learning and natural language processing.

- **Natural Cycles**

Natural Cycles is a Swedish company that offers a fertility awareness smartphone app that assists women in family planning by allowing them to stay on top of when they are fertile. Natural Cycles claims women could use the app to plan pregnancies. Natural Cycles is certified as a contraception method both in Europe and the US.

- **Siemens Healthineers**

Siemens Healthineers is a German company that offers a population health management software called Proactive Follow-up, which it claims uses natural language processing to help healthcare providers and medical professionals identify and take action on the discrepancy between hospital best practices and the care that patients at the hospital actually receive.

- **Blueprint Genetics**

Blueprint Genetics is a Finnish company that offers tests that analyze patient DNA for genetic disorders using machine learning, which the company claims can help healthcare providers assist patients in learning about hereditary diseases they may have and finding preventive treatments. The company conducts DNA tests to detect cardiovascular, dermatological, neurological, and pulmonary disorders, among others.



- **BioBeats**

BioBeats is a digital health and AI company that specialises in creating easy-to-use corporate and personal wellness solutions. After first dabbling in hardware, the company shifted to B2B and health systems. Through its BioBase app, it works with employees at client companies to help them manage their stress in the workplace.

AI Adoption across Asia

- **iCarbonX**

iCarbonX is a Shenzhen, China-based company with 76 employees. The company offers an application development platform, which it claims can help software developers at healthcare businesses create health monitoring apps using machine learning.

- **Sigma Technologies**

12 Sigma Technologies is a Chinese company which offers medical data analysis software, which it claims can help hospitals and physicians make medical diagnoses using deep learning.

- **Lunit**

Lunit is a Seoul-based company which offers a software called Lunit INSIGHT, which it claims can help hospitals and doctors identify abnormalities in chest radiographs using computer vision.

- **FRONTEO Healthcare**

Fronteo Healthcare is a Tokyo-based company which offers a software called the Fall Prediction System, which it claims can help hospitals identify which patients might be more likely to fall down using machine learning.

- **Bot M.D.**

Bot M.D. is an AI application that acts like an assistant. It can answer clinical questions, transcribe dictated case notes and automatically organize images and files.

- **DeePathology.ai**

DeePathology.ai develops state of the art AI solutions for various problems in pathology. The company has developed a unique platform that allows them to create customized solutions super-fast. Among their solutions are Pylori detector, Cell Detection and Tissue Segmentation for skin cancer, Alzheimer and more.

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- **ARTIVATIC.AI**

Artivatic is built on life-science focused technologies that not only understands insights but also is able to take decisions as 'like humans' on behalf of businesses for better real time personalized consumer experience, automated decision making, improving performance and efficiency with increasing in conversion and revenue. The businesses can know more, and faster in real time.



Impact on Revenue and Cost

The global artificial intelligence in healthcare market size is anticipated to hit USD 32.8 billion by 2027, growing at a CAGR of 42.9% over a forecast period 2020 to 2027.

- Key clinical health AI applications can potentially create \$150 billion in annual savings for the United States healthcare economy by 2026.
- AI in healthcare is currently geared towards improving patient outcomes, aligning the interests of various stakeholders, and reducing healthcare costs.
- The Artificial Intelligence in Life Sciences Market is expected to reach USD 3445.60 million by 2025, at a CAGR of 21.1% over the forecast period 2020 to 2025.
- Most industries, including life sciences, are witnessing a transformation, owing to increasing cost pressure, a greater need for productivity, and disruption caused by new and innovative market players.

Factors responsible for growth of AI in the Healthcare & Life sciences industry in terms of revenue are: -

- The rising demand to reduce healthcare costs, increasing adoption of precision medicine, growing importance of big data in healthcare, and declining hardware costs are some factors propelling adoption of AI technology in healthcare industry.
- Moreover, rise in potential applications of AI-based tools in medical care and growth in venture capital investments are anticipated to aid growth in future.
- Increasing number of cross-industry partnerships is expected to boost adoption of AI in the healthcare sector, which is further responsible for its lucrative growth rate.

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- a) For instance, in March 2018, Microsoft announced partnership with Apollo Hospitals, one of the prominent healthcare systems in India. The partnership was focused on developing and deploying new machine learning models for predicting the risk of developing cardiac diseases and aid doctors in treatment planning.
- b) Similarly, in September 2018, GNS Healthcare entered into a cross-industry partnership with Alliance and Amgen for clinical trials in oncology. The collaboration was aimed at applying data from clinical trials and Artificial Intelligence (AI) to identify factors that expedite treatment responses in metastatic Colorectal Cancer (CRC) patients.
- In addition, increasing applicability of AI-based tools in medical care and rise in venture capital investments can be attributed to the surge in demand for this technology. For instance, CarePredict, Inc. uses AI technology to monitor changes in behaviour patterns and activity for early detection of health issues.
- Increase in venture capital funding is a key factor propelling growth of healthcare AI start-ups, which is further contributing to market growth.
 - a) For instance, in July 2018, Kleiner Perkins and GV invested USD 21 million in Viz.ai-an AI in healthcare start-up.
 - b) Similarly, HealthPlix Technologies Pvt. Ltd. raised USD 3 million in a Series A funding round led by Kalaari capital and IDG Ventures India in July 2018.
 - c) Some of the prominent venture capitalist firms operating in this sector are ACCEL PARTNERS, Data Collective, General Catalyst Partners, Khosla Ventures, and others.

Growing adoption of AI in healthcare & life sciences industry is expected to boost the demand for these services, thereby, leading to an increase in revenue.



Challenges

Some of the key challenges faced by the Global Healthcare & Life Sciences leaders in AI adoption are explained as follows: -

1. Lack of Data

If you think about AI in other industries, it's relatively easy to access the information needed to train the algorithm. But in healthcare and life sciences, this information is highly regulated. For instance, in ultrasound, the regulation around the ownership of images. That makes it trickier to get the sheer volume of images necessary to train, design, develop and validate a safe, effective, and meaningful AI-enabled device for various clinical applications.

2. Data Integrity

Healthcare organizations have always managed large amounts of data, but not necessarily in a digitized format. They face added complexity when modernizing processes due to strict patient data privacy regulations. It can prove difficult to cleanse data like how a non-Healthcare organization might do to optimize the integrity of the insights. Fortunately, most Healthcare organizations are prepared for such compliance challenges when transitioning to disruptive technologies such as AI. Healthcare organizations should study AI integrity in other industries to better understand the blueprints for success.

3. Risk and patient/doctor acceptance

Handing over critical illness diagnosis to a machine is something not many are prepared to do. Despite being positioned as augmenting doctors, i.e., proposing some options that the human can dismiss or use as a starting point. Many see this as a slippery slope that they don't want to start on. It's all about confidence, and that's a challenge AI has in every mission-critical application.



4. Infrastructure

While healthcare organizations are awash with traditional technologies like monitoring machines and newer tech like computer-guided operating room tools, they still face aging infrastructures that are not technologically capable of integrating a wide range of solutions.

5. Regulations

Regulatory requirements such as HIPAA and budget issues keep healthcare & life sciences organizations from adopting AI at a faster pace. But once organizations and governments will start to adopt and dedicate funds for these projects, they will be quick to understand the immense advantages and savings these technologies can bring, and everybody will follow.

6. Cost & ROI

As a costly investment for a healthcare organization, implementing AI automation technology brings with it pressure to demonstrate an immediate return on investment. And implementing AI technology is an iterative process, creating a variety of organizational impacts that aren't immediately quantifiable. Organizations need to commit financially to invest in AI technology, and must accept that other organizational changes will result from these technological changes.

7. Where to begin?

Healthcare leaders hear the buzz around AI and feel as if they should be adopting it in their organization, but oftentimes, they don't know where to start. Hospitals need a vendor partner with healthcare expertise who will help them quickly identify candidate AI processes, and stand them up using industry best practice.

To maintain public trust and the ethical use of data by AI, many life sciences & healthcare organizations, along with the governments of various nations, are working toward creating a robust AI-based framework.



The Way Forward

AI is making healthcare more connected, affordable, and personalized. New advancements are enabling clinicians to gather more comprehensive data and increase efficiencies and collaboration, all while reducing costs. This is happening right now with the outbreak of Omicron variant as genome sequencing of affected people is shared on publicly available databases.

During 2022, we can expect an acceleration in AI to assess huge volumes of health data at lower cost. This covers everything from more accurate cancer diagnostics to predictive analytics. India's NASSCOM Covid-19 taskforce used AI to deliver a population-scale pandemic response platform to the state governments of Telangana and Karnataka—parsing massive datasets to guide on Covid-19 indicators to predict outbreaks and manage care more effectively.

The global healthcare & life sciences industry is on the cusp of an exciting era, as rapid developments in artificial intelligence present the opportunity to make more effective drugs, faster and at reduced cost. Developing an appropriate AI strategy is beset with challenges and will require healthcare companies to work in new ways and to collaborate more closely than ever before. Although it will be some time before the first AI-enhanced drug is approved (given the typical 10-plus years it takes to get from target discovery to a marketed drug), the promise of AI is resulting in broad investment across the industry, and the impact will be far-reaching.

AI and robotics have enormous benefits that are changing every aspect of the healthcare and life sciences ecosystem worldwide. AI-driven tools and the Internet of Medical Things have already affected the lives of millions of individuals encouraging them to follow a healthy lifestyle and adjust to proactive health management.

The growth of AI and automated processes often creates concerns that the human touch will be removed from the health-care delivery process. What the industry is finding, however, is the opposite is becoming true: AI can extend the resources and capabilities of overworked health-care professionals and vastly improve processes.

Critically, as AI allows for the synthesis and more precise distribution of the growing wealth of medical data and insight the industry is generating, it is allowing for more efficient sharing and collaboration in pursuit of better, less-expensive outcomes. As part of that, we are beginning to see the developments of personalized risk models that are updated as new data becomes available.

Global AI Adoption Report 2022

Life Sciences & Healthcare Industry



Ultimately, AI is changing the whole sociology of decision making within the Healthcare & life sciences industry, towards a more collaborative and change-making system.

Using AI, multiple perspectives from data and insight provided by both patients and health-care providers are synthesized in not only immediate diagnosis and treatment, but in monitoring wellness on a continual basis as well.

AI needs to work for health-care professionals as part of a robust, integrated ecosystem. It needs to be more than deploying technology—in fact, the more humanized the application of AI is, the more it will be adopted and improve results and return on investment. After all, in Healthcare & life sciences, the priority is the patient.

Investments in R&D, collaborations with other industry participants, and service differentiation are among the key strategies to be adopted by the players for gaining a competitive edge.

Artificial intelligence adoption in Life Sciences & Healthcare industry is on the rise, but organizations must improve their adoption strategies, data integrity and leadership awareness to reap the benefits.

AIQRATE

A Bespoke Global AI Advisory & Consulting Firm

AIQRATE Advisory & Consulting

AIQRATE, A bespoke global AI advisory and consulting firm. A first in its genre, AIQRATE provides strategic AI advisory services and consulting offerings across multiple business segments to enable clients on their AI powered transformation & innovation journey and accentuate their decision making and business performance.

AIQRATE works closely with Boards, CXOs and Senior leaders advising them on navigating their Analytics to AI journey with the art of possible or making them jumpstart to AI@scale approach followed by consulting them on embedding AI as core to business strategy within business functions and augmenting the decision-making process with AI. We have proven bespoke AI advisory services to enable CXOs and Senior Leaders to curate & design building blocks of AI strategy, embed AI@scale interventions and create AI powered organizations. We have collectively executed 3000+ AI/Analytics engagements across 350+ global clients for 14 industry segments and have built & scaled 100+ AI & Analytics Center of Excellence & Development centers.

AIQRATE's path breaking 50+ AI consulting frameworks, assessments, primers, toolkits and playbooks enable Indian & global enterprises, GCCs, Startups, SMBs, VC/PE firms, and Academic Institutions enhance business performance and accelerate decision making.

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