

Emergence of **Generative AI** in the **Healthcare** **Industry**



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Introduction

“ When it comes to Generative AI, inaction is not an option for CMOs. ”
Boston Consulting Group (BCG)¹

Generative AI (GenAI) is a subset of Artificial Intelligence (AI) that involves a class of algorithms capable of learning from multimodal data (text, image, video, and audio). These algorithms have the ability to respond to user prompts by analyzing patterns learned from existing data. This technology is still in its preliminary stages of development, but can potentially revolutionize the IT industry in several ways. Examples of GenAI use cases include automation, augmentation, and process improvement, all contributing to enhancing customer experience and employee productivity.

Looking back, AI experienced declining funding and interest in 1974 due to unrealistic expectations and limited progress. This period of low AI funding and interest was dubbed the "AI winter." However, the field has since rebounded. AlphaFold2's recent success in solving the protein-folding problem is a breakthrough that could pave the way for new drug development and medical breakthroughs. The healthcare sector actively embraces GenAI to enhance patient experiences and expedite clinical decision-making. This industry is utilizing this technology to reduce the workload of Healthcare Professionals (HCPs) and boost operational productivity. According to a report by Market.us experts ², the global GenAI healthcare market is expected to grow exponentially until 2032. The major emerging tech capabilities of large language models drive this growth.

Clinical application services have major impacts on the health industry. These impacts include the creation of prescription summaries, treatment plans, automated Food and Drug Administration (FDA) approval, and identification of drug sequencing.

Significance of GenAI in the healthcare industry

Patients, HCPs, and caregivers experience difficulties navigating appointments, diagnoses, and treatment plans. Siloed databases, translation of prescriptions, and remote monitoring of devices are scattered throughout many phases of treatment.

In healthcare industry operations, a huge chunk of unstructured data is present at different phases. This data includes any form of clinical notations, diagnostic images from several machines, medical tabulation of several processes, and recordings of various processes. The above-mentioned major data fabrication is required for numerous medical approvals, insurance claims, and regular updates of patient history by their assigned practitioner.

Focusing on data security is paramount in this industry. Having a legal framework to ensure patient safety is crucial for technology use. Automating the time-intensive process is essential, regardless of the volume of data. It involves addressing major claims, such as denial management, authorization process, administrative process, provider relationship management, and clinical operations.

Market growth opportunities for GenAI in the healthcare sector

In North America, the GenAI healthcare market observed the highest revenue of 36% in 2022 to facilitate decision-making, predictive modeling, and analytics. Implementation of GenAI in this region has observed significant regional growth in developed countries like Canada and America. Mexico is also contributing to generating some revenue benefits.

In Europe, on June 14, 2023, European Union (EU)4 members passed one of the AI regulations under the EU's AI Act. This regulation states that GenAI systems must be scrutinized significantly before any commercial release. This breakthrough implies that the world is embracing the capability of GenAI to improve the efficiency of all the personas involved in the healthcare industry. This also helps regulate the safety and security of critical procedures like clinical trials, FDA-related approvals, and preclinical studies.

The Asia-Pacific region also has an expected Gen AI growth from 2023-2032. The implementation of GenAI in this region is expected in countries like China, Japan, Singapore, and India. This technology's growth is expected to impact the healthcare industry's forecasted growth positively.

Opportunities

A specialized type of AI that can be trained with huge amounts of data to translate existing content and generate original content is termed a Large Language Model (LLM). In the healthcare industry, LLMs can help patients with clinical trials by mapping each trial's criteria with the patient's individual attributes mentioned in Electronic Health Records (EHR). LLM views in healthcare organizations can hold many industry opportunities.



Figure 1: Opportunities to improve patient care persona-wise.

Risks

Implementing GenAI in healthcare poses risks alongside opportunities.



Figure 2: Risks of GenAI for each persona

Modernizing the healthcare sector with GenAI

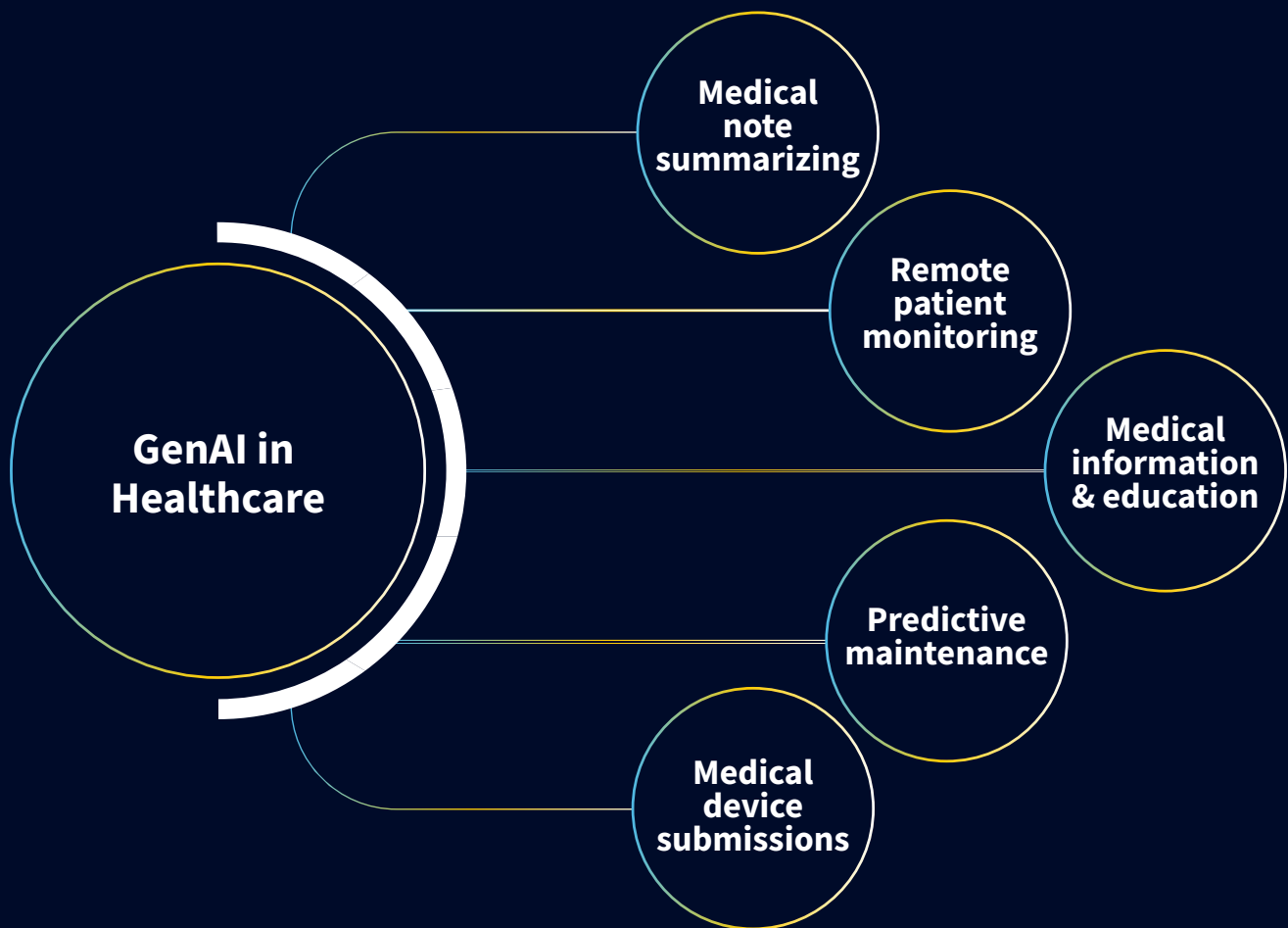


Figure 3: The use of generative AI in the healthcare industry.

The healthcare ecosystem can be improved by enhancing the experience in the following major areas:

Medical note summarizing

A generative AI model is used to generate a discussion-based note that summarizes the key findings of the patient visit. The note encompasses the patient's primary concerns, medical background, physical examination results, and proposed treatment strategy. One such example is Amazon AWS, which has launched Healthscribe. Software vendors can utilize this HIPAA-eligible service to create clinical applications that automatically generate clinical notes by verifying patient and healthcare professional conversations. Healthscribe has been shown to be accurate and efficient in generating medical notes.

Remote patient monitoring

Healthcare providers can receive real-time alerts on patient health, improving communication and coordination.

Medical information and education

GenAI has significantly supported the creation of personalized educational materials for patients or caregivers. These materials consider their individual needs and understanding of health. It can also provide realistic and immersive training experiences that can help medical professionals to learn new skills and techniques.

Predictive maintenance

GenAI utilizes advanced imaging equipment and ventilators to accurately predict when medical devices require maintenance. Under the purview of the process, HCPs get an early alert of any risk or failure of medical devices to restore the supply chain process quickly. Hospitals, pharmaceutical companies, and medical device manufacturers use GenAI to improve equipment, uptime product quality, and predict device failures.

Medical device submissions

GenAI helps generate the necessary documentation, such as the Premarket Notification 510(k) or Premarket Approval (PMA) application. Posting project documentation can aid in regulatory compliance and submission tracking.

Barriers and Roadblocks

Despite discussing all the market opportunities and growth of GenAI in the healthcare field, the entire ecosystem for implementation is at its very nascent stage. The implementation still holds its own definite technical and regulatory challenges.

Modernizing healthcare suggestions still has roadblocks. The GenAI implementation requires a huge chunk of data to be trained successfully to produce accurate output. The data must include medical records, imaging studies, and lab results, which can be very costly to collect and process.

Additionally, a crisp regulatory framework is required to verify the ethical use of GenAI in the healthcare sector, as it requires keeping patient's safety at prime importance. Any minor error in the GenAI report, such as in medical note summarizing, medical information, or approval document, can put the patient's life at the highest risk.

Despite all challenges, healthcare success stories exist where GenAI capabilities are leveraged for growth. For instance, one of the largest dental care companies uses GenAI to automate post-call summaries and categorize calls. This is to help healthcare providers and caregivers respond to patient queries and understand medical records more efficiently. It showed more than 70% accuracy, resulting in a 60% reduction in After-Call Work (ACW) time. It also helped in improving customer and agent satisfaction in the client's ecosystem's contact center transformation solution integrations. The transformation of the contact center has resulted in increased operational efficiency, agent productivity, and customer satisfaction.

Future Ahead

The potential of GenAI in transforming the healthcare industry is enormous and holds great promise. In summary, the accuracy of medical data and predictions must be optimized due to their critical impact on people's lives. The revolution of GenAI into this space presents an opportunity to evaluate the criticality of the current state and implement future innovations more smartly. Precision in measuring the user experience with in this domain is crucial for optimizing touchpoints while sustaining a healthy ecosystem.



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