

The Disruptive Influence of Generative AI in Life Science and Healthcare

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This blog explores the emerging virtual collaboration of Generative AI in the fields of Life Science and Healthcare. It highlights the potential for significant advancements and use cases in personalized and convenient patient services, as well as in the management of care and administration across hospitals, physician groups, payer operations, and the drug discovery value chain.

Highlights

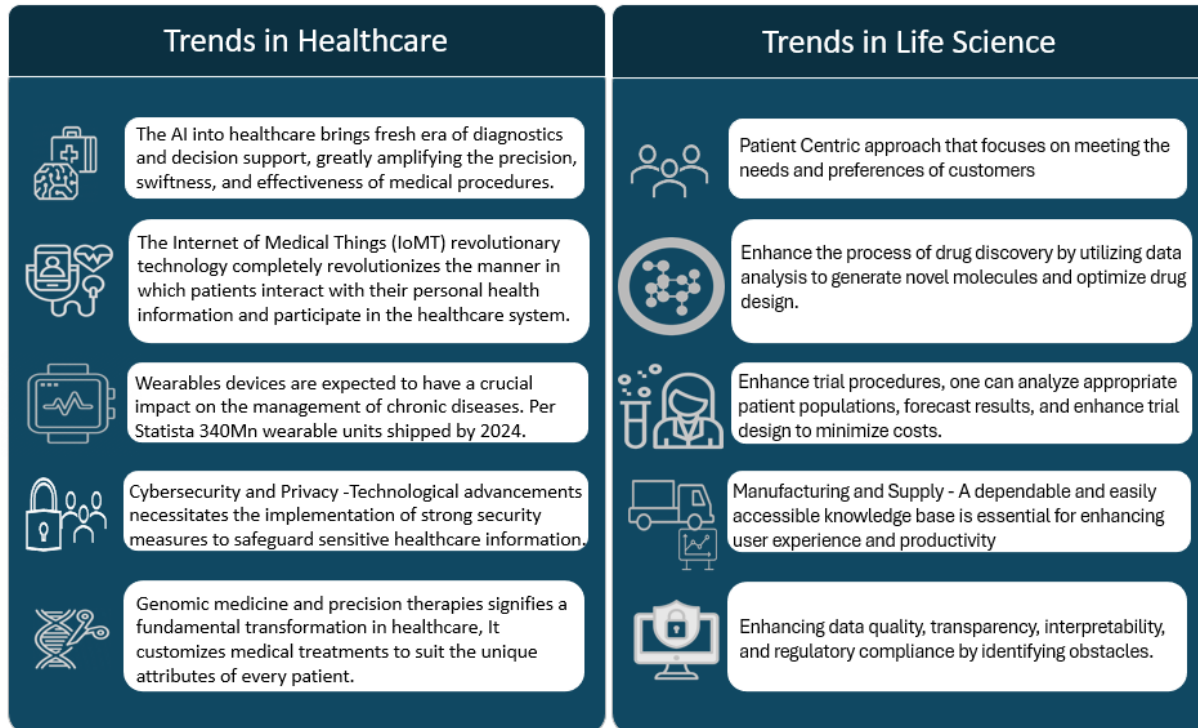
- According to a recent survey conducted by a prominent Health payer, generative AI has been ranked as the most influential technology by 77% of leaders. This places it ahead of other emerging technological capabilities like advanced robotics, quantum computing, augmented reality/virtual reality (AR/VR), 5G, and blockchain.
- The healthcare sector witnessed a significant surge in Generative AI, with its market value reaching USD 1.07

billion by 2022. Forecasts indicate a remarkable growth rate of 35.14% CAGR from 2023 to 2032, projecting the market to surpass USD 21.74 billion by 2032.

- Gen AI technology has the potential to introduce enterprise intelligence, thereby liberating clinical resources from administrative duties and empowering healthcare professionals to concentrate on more valuable tasks.

Trends

The life science and healthcare industry have the potential to utilize gen - AI technology throughout the value chain in the foreseeable future. This technology can be applied in various ways, including ensuring continuity of care, providing valuable network and market insights, and facilitating value-based care.



- Below are some of the key trends across life sciences industry enabled by GenAI are:
- **Accelerate drug discovery** by generating new molecules and optimizing drug design through data analysis.
- **Optimizing Clinical Trials:** Optimizing trial processes by analysing suitable patient populations, predicting outcomes, and improving trial design for cost reduction.
- **Shifting Manufacturing Paradigm** – needs accessible and reliable knowledge base, drives superior user experience and productivity
- **Customer Centricity** – Personalization, Omnichannel Experience, transparency, value - based care

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- Ethical Concerns and Regulatory Framework: Identifying challenges and improving data quality, transparency, interpretability, and regulatory compliance

Challenges

- Traditional AI aims to perform specific tasks based on predefined rules and patterns, but having challenge to mimic entirely new data that resembles human - created content.
- Treatments were frequently administered relying on general population data, without giving much thought to

individual variances.

- The journey from drug discovery to market availability has proven to be a challenging and lengthy process.
- The healthcare sector is progressively relying on data and must advance in the analysis of extensive datasets, identification of patterns, prediction, and evidence - based decision - making.
- The chatbot system has successfully engaged with individuals and provided numerous solutions. However, it lacks a means to collect social determinants of health (SDOH) data.



The Gen AI’s Technical Impact:

Payers Prospects:

After the covid era consumers are demanding more convenience in their health Insurance, its directly impact to Payer in terms of rising cost and competitive pressure. Gen AI has the potential to enhance the operational efficiency of Payers, enabling them to deliver improved services to customers.

Product Design and Marketing:

To develop customized plans and products, it is essential to examine the distribution of consumers. Additionally, analyzing customer feedback by extracting and summarizing themes from online text and images can provide valuable insights. Enhancing sales support and chatbots can assist potential members in comprehending coverage options and making informed decisions about their plans.

Claims and Prior Authorization Management:

Using Gen AI algorithms to automate the verification of insurance information guarantees the prompt and precise processing of insurance claims, resulting in decreased delays and enhanced financial workflows. Summarize manual and denied claims problems and identify potential solutions; compile data on intricate claims to expedite processing; automatically generate summaries and results for prior authorization requests; compose replies to appeals and grievances inquiries.

Provider engagement:

Analyze the characteristics and networks of different plans/products, create standard communication materials such as welcome letters, reports, and new - member requirements. Summarize any discrepancies in provider directories and update open panels, generate reports and observations for providers and vendors regarding performance and closing gaps.

Member Services:

Gen AI adaptive Chatbots possesses the capability to examine the sentiment of the member and detect patterns of misinformation. By comprehending the concerns and emotions of the member, Payers can customize their communication approaches to effectively tackle particular problems, alleviate anxiety, and promote improved adherence.

Providers Prospects:

Healthcare practitioners frequently encounter demanding workloads and extended shifts. They might be required to oversee a substantial volume of patients, tackle administrative responsibilities, and stay updated with the latest advancements in the medical field, all while operating within restricted time constraints.

Clinical Notes Documentation:

Generative AI has the capability to enhance and automate the process of recording clinical notes by extracting important information from patient conversations and condensing them into physicians' notes within Electronic Health Records. Additionally, it can generate clinical notes like visit summaries, discharge notes, radiology reports, and pathology reports.

Medical Imaging and Data Handling:

To safeguard sensitive patient information contained in medical images, it is imperative to prioritize security and privacy compliance to prevent unauthorized access and data breaches. One such challenge is the management of extensive and intricate datasets produced by various imaging techniques, which demands efficient data handling solutions and substantial storage capacity. Moreover, the integration of medical imaging into Electronic Health Record (EHR) systems is hindered by interoperability issues and variations in data formats.

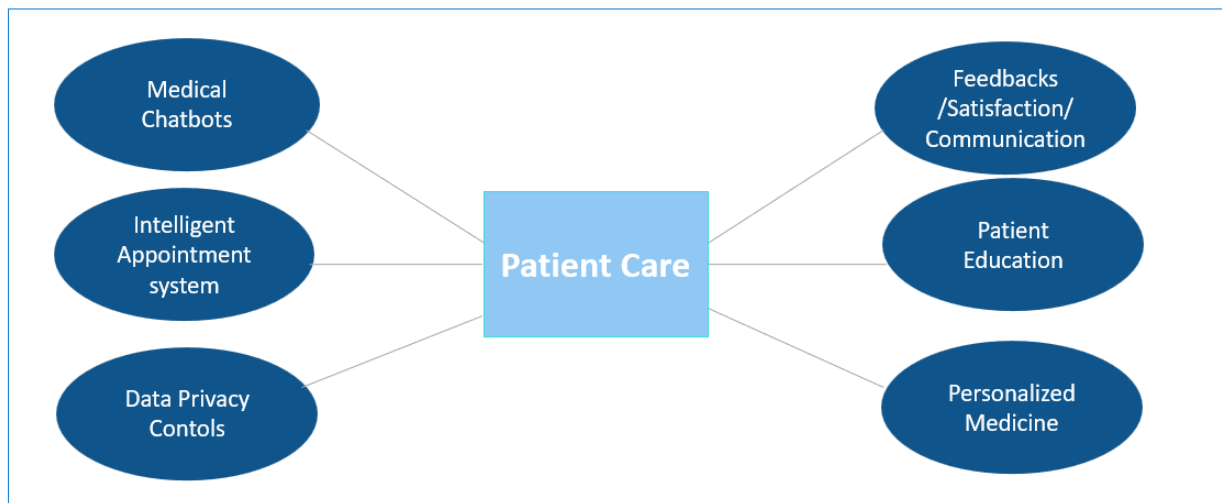
Generating synthetic medical data

Gen AI offers the capability to produce fabricated healthcare information that emulates genuine patient data, yet it is completely fictional and has no connection to real individuals. This synthetic patient - level medical data provided by Gen AI is remarkably realistic, enabling the training of machine learning models without any potential threat of disclosing confidential information pertaining to actual patients.

Clinical Operations:

Gen AI Create post - visit summaries and instructions; generate and consolidate care coordination notes, updates in electronic medical records (EMRs), transcriptions, and messages; produce workflow materials and schedules for various processes and locations; design educational materials for disease identification and management; formulate tailored training programs for clinicians of different specialties and integrate program requirements.

Members Prospects:



Patients often find themselves disappointed when they have the expectation of receiving medical advice from contact centers, this is because contact centers can only offer limited information about the product or treatment, unable to interpret complex medical terminology, typically limited to prescribing information and clinical trial data.

Medical Information and Education:

Patients have the ability to engage in natural language conversations with Chatbot and inquire about drug - related concerns such as dosage, side effects, and interactions. Additionally, Chatbot can offer students and healthcare professionals immediate access to the most up - to - date research, guidelines, and practices, thereby facilitating their continuous learning and growth.

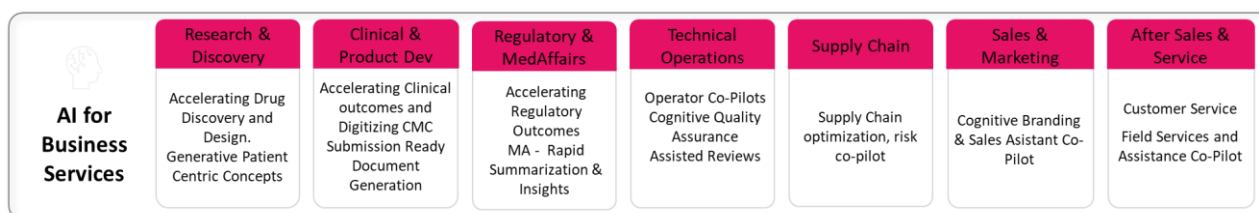
Consumer Feedback:

Analyze customer feedback by summarizing and extracting themes from online text and images. Additionally, develop personalized care instructions, videos, visuals, and communications based on the feedback received. Enhance chatbots to better serve members with nonclinical inquiries. Lastly, automate the generation of notifications and outbound communications for improved efficiency.

Personalized Medicine:

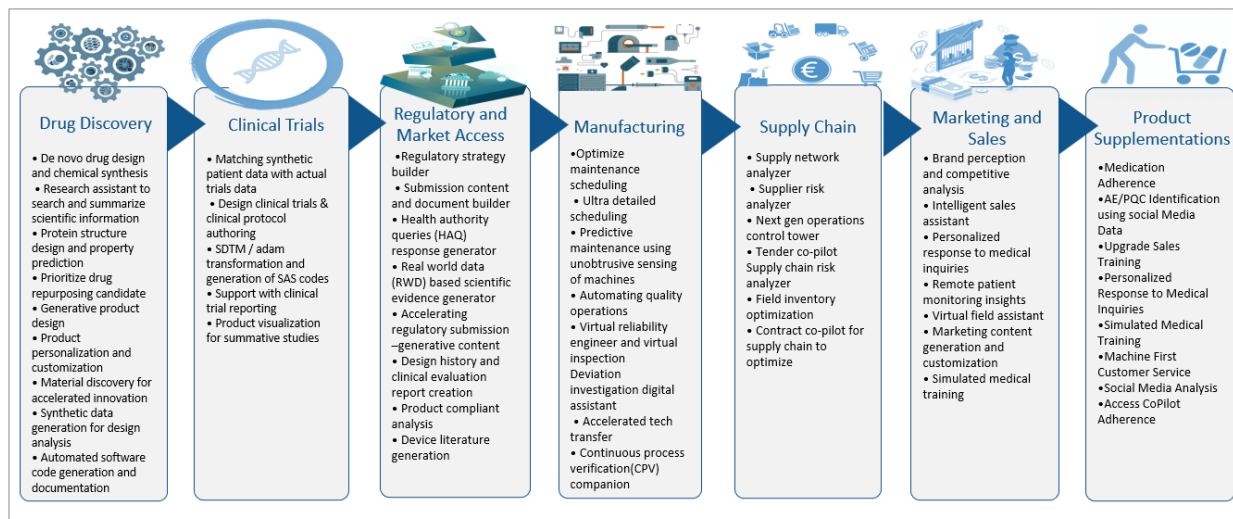
Gen AI has the capability to examine patient - specific information, such as genomics and proteomics, in order to facilitate the advancement of personalized medicine strategies, customizing treatments for each individual patient.

Life Science Prospects:



The demand for skilled professionals in the life sciences industry is surpassing the available talent pool worldwide, the expenses associated with acquiring such expertise are on the rise. The focus is shifting towards prioritizing the well - being

of individuals and the environment rather than solely pursuing profits. Technology plays a crucial role in addressing these challenges, while internationalization and fortifying supply chains are essential for success.



Supply Chain Resilience:

Gen AI has the potential to improve supply chain management through its ability to anticipate and address disruptions. By examining worldwide logistics, monitoring inventory levels, and predicting demand, it can contribute to a stronger and more adaptable supply chain for medical equipment and pharmaceuticals.

Drug Development optimization:

Gen AI possesses the capability to develop clinical trials and compose protocol documents. Additionally, it has the ability to generate summaries of clinical trials, encompassing the study design, patient characteristics, efficacy and safety results, and statistical analyses, thereby considerably diminishing the time and effort needed to manually compile this information.

Pharmacogenomic Insights:

Gen AI has the capability to examine pharmacogenomic data in order to anticipate how individuals will respond to medications. By incorporating pharmacogenomic information, drug prescriptions can be customized according to genetic factors, resulting in improved treatment outcomes and reduced occurrence of adverse effects.

Conclusion

The Life science and healthcare (LSHC) industry has experienced remarkable progress and possibilities with the advent of generative AI. This innovative technology has the ability to produce fresh data, enhance diagnostic procedures, optimize treatment approaches, and expedite the discovery of new drugs, thereby revolutionizing the LSHC sector. As we continue to explore the capabilities of generative AI and address the associated challenges, we are poised to witness a new era of innovation and breakthroughs in healthcare.

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Rohit Malik, Chief Architect (Life Sciences and Healthcare - Strategic Capability Group of TCS), is an accomplished professional delivering over 23+ Years managerial and functional career success in driving Futuristic IT Ecosystems, IT Solution Delivery, Innovation, Business Process Reengineering/Benchmarking using Digital Technologies. He has mastered the administration of establishing businesses, managing IT program, articulating technology market developments, invigorating businesses, and service delivery. He has a strong expertise in AWS Cloud Platform, Azure and GCP Cloud Platforms, AI / ML, Generative AI, Application Migration & Modernization, Microservices, Big Data and Hybrid Integrations.

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