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Artificial Intelligence in Healthcare Market Assessment, By Component [Hardware, Software and Services], By Technology [Machine Learning (ML), Natural Language Processing (NLP), Context-Aware Computing, Robotic Process Automation (RPA), Computer Vision and Others], By Application [Robot-Assisted Surgery, Administrative Workflow Assistance, Cybersecurity, Virtual Nursing Assistant, Clinical Trials, Diagnosis, Customer Service Chatbots, Drug Discovery and Others], By End-user [Hospitals & Clinics, Pharmaceutical & Biotechnology, Patients and Others], By Region [North America, Europe, Asia Pacific, Middle East & Africa and South America]

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Abstracts

The Global Artificial Intelligence (AI) in Healthcare Market size was valued at USD 16.47 billion in 2022 which is expected to reach USD 198.32 billion in 2030 growing at a CAGR of 36.48% for the forecasted period between 2023 and 2030. The market is being driven by factors such as increasing adoption of AI technologies, generation of large volumes of patient-health-related data, increasing demand for personalized and precision medicine, growing application of AI in medical imaging and diagnostics, and increasing potential for AI-based tools for the elderly population. Recent advancements in AI have been accelerated by the impact of COVID-19, thus making AI an indispensable part of healthcare.

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As AI technologies became increasingly popular in healthcare applications, key market players focused on product innovation and technical partnerships to extend their product range and meet increasing demand. For instance, in 2022, Amazon Web Services launched Amazon Omics for precision medicine. Amazon Omics uses AI, ML, and deep learning-based algorithms to aid healthcare professionals in gaining better understanding during patient care. This service is designed to aid in identifying the most effective treatment or prevention choices by efficiently managing complex bioinformatics tasks.

Growing Application in Medical Imaging and Diagnostics

Researchers are increasingly exploring new methods to incorporate artificial intelligence into medical imaging. In recent times, research institutions and universities have been actively working towards expanding the use of AI in cancer treatment. The COVID-19 pandemic led to delays in diagnosing and screening of diseases, including routine check-ups and cancer screenings, which had resulted in the detection of more advanced stages of cancer. Deep learning algorithms have emerged as the preferred approach for analyzing radiology imaging, such as CT, MRI, PET, ultrasound, and addressing diverse tasks like tumor detection, segmentation, and disease detection. Multiple studies have demonstrated significant performance enhancements of deep learning-based models compared to conventional machine learning algorithms.

Adoption of Machine Learning in Healthcare

In the past five years, significant progress has been made in AI, ML and data science, leading to numerous technological advancements. The convergence of fast computer processing, expansive data repositories, and a robust pool of AI experts has facilitated swift growth in AI tools and technology in the healthcare sector. As a result, there is a huge demand where AI technology is poised to revolutionize society through its widespread adoption and profound impact. In the healthcare sector, AI is being widely used in dermatology, electronic health records (EHR), surgical robotics, drug manufacturing, psychiatry etc. AI dermatologist, an innovative prediagnostic app, is able to identify one of the most dangerous diseases which is skin cancer. Globally, more than 2 people die of this disease every hour.

Government Initiatives & Regulations

In June 2023, the U.S government announced its initiatives to ensure the safe progress and implementation of artificial intelligence. Additionally, they are inviting the public to

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actively contribute to the formulation of the government's AI strategies. Healthcare experts have been raising awareness about the necessity for the healthcare industry to adopt a proactive approach regarding AI safety. They emphasize the importance of developing and implementing measures to ensure the transparent deployment of AI in clinical settings. For instance, on 27th October 2021, the Food and Drug Administration (FDA) provided specific guidance regarding the use of AI in medical devices. The FDA, in collaboration with Health Canada and the United Kingdom's Medicines and Healthcare products Regulatory Agency, published guiding principles that outline the appropriate utilization of AI and machine learning (ML) in medical devices.

North America to Dominate

In 2022, AI in healthcare market was largely dominated by North America region This is primarily due to the growing utilization of AI/ML technologies, advancements in healthcare IT infrastructure, initiatives taken by the government, and the presence of numerous tech giants. The United States has witnessed large investments in AI/ML, which has resulted in the substantial influence of these technologies. The country stands out as the primary destination for many investment deals in AI startups.

The level of funding in the United States experienced significant growth in 2020 and 2021. For instance, Insitro, a company focused on utilizing machine learning for drug discovery and development, secured USD 400 million in Series C financing in March 2021. Canada Pension Plan Investment Board (CPP Investments) lead the financing round, accompanied by notable contributions from existing investors such as Andreessen Horowitz, funds and accounts advised by T. Rowe Price Associates, Inc., Casdin Capital, and funds and accounts managed by BlackRock.

The United States holds the top position globally in terms of preparedness for integrating AI in the public sector, with an average score of 85.48 out of 100. The country excels in crucial areas such as AI vision, as well as AI governance and ethics.

Robot-Assisted-Surgery Contributes Largely to Market Share

The robot-assisted-surgery segment dominated the market in 2022 and accounted for the largest market share during the forecasted period. Robotic surgery has witnessed a relatively recent integration of AI, primarily in imaging and navigation applications. Initially, the emphasis was on detecting features and assisting surgeons through computer-guided interventions for pre-operative planning and intra-operative guidance. This gradual transformation in surgical practice can be attributed to technological

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advancements in imaging, navigation, and robotic interventions facilitated by AI. Incorporating AI in surgical robotics has several advantages such as AI's ability to learn from large data sets, identifying new trends and reducing physical stress of the surgeon. For instance, the da Vinci Surgical System, equipped with AI capabilities, allows surgeons to perform precise and minimally invasive prostatectomies. AI algorithms assist in preoperative planning, identifying the optimal approach and assisting surgeons in navigating complex anatomical structures during the procedure.

Impact of COVID-19

The COVID-19 pandemic expedited the acceptance of artificial intelligence in the healthcare sector. AI-powered solutions and tools have the capability to operate swiftly, can be implemented on a large scale, and can adapt to the rapidly changing technological environment. Various market players, including startups, established corporations, universities, and others, are actively contributing their skills and offerings in the field of AI. For instance, companies like Current Health , a remote-monitoring startup based in the U.K., helped prominent institutions such as Mayo Clinic and Baptist Health during COVID-19. Such startups play a crucial role in the industry's swift adoption of digital solutions and are rapidly expanding their operations to meet the increasing demand. Major tech companies such as Microsoft, Google, Apple, Amazon, and Facebook are engaged in various initiatives pertaining to remote communication between patients and healthcare providers, contact tracing, drug development, and many more features.

Impact of Russia-Ukraine War

The war between Russia and Ukraine led to closure of business operations by many tech and healthcare organizations. Organizations such as Siemens Healthcare GmbH, IBM Corporation, Nvidia Corporation, Microsoft Corporation and many others shutdown their offices and business activities in Russia. Sanctions were imposed by more than 30 countries including Australia, Canada, Norway, Japan, United States, among others. Siemens AG exited the Russian market due to the Russia-Ukraine war. The company initiated the process to terminate its industrial operations and ceased all industrial business activities including healthcare in May 2022.

Key Player Landscape and Outlook

The global AI in healthcare market is highly competitive, with several established players and new entrants competing for market share. Some of the trends taking place

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in the market are advancements in natural language processing & conversational AI, and integration of electronic health records (EHRs) & wearables. Businesses are placing their emphasis on automating repetitive tasks, enhancing customer service through chatbots, optimizing supply chain management, and employing predictive analytics to make more informed decisions, all in pursuit of gaining a competitive edge in the market.

For instance, in 2023, Epic Systems Corporation announced its partnership with Microsoft Corporation, for a primary objective of integrating the Azure OpenAI service into Epic's electronic health record (EHR) software. The collaboration aims to enhance the efficiency of both physicians and back-office professionals. Initially, Epic's focus lies in utilizing OpenAI's GPT-4 AI language model to assist healthcare workers in drafting message responses to patients and to analyze medical records for identifying trends.

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*Companies mentioned above DO NOT hold any order as per market share and can be changed as per information available during research work

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