

Special Report

Emerging Areas of Artificial Intelligence (AI) use in Healthcare



Advanced Applications of AI in Healthcare

Advanced Applications of AI in Healthcare- An Overview

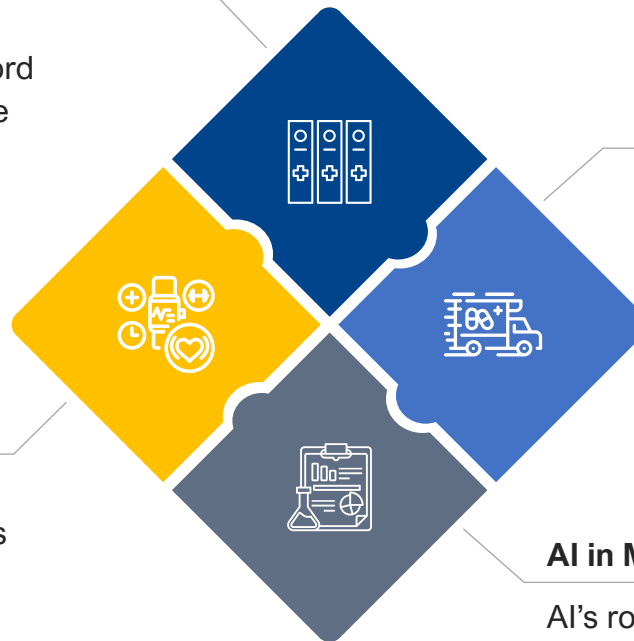
AI is revolutionizing the healthcare industry with its groundbreaking applications in the field, resulting in development of advanced treatments by various key players in the market

AI in Electronic Medical Records (EMR)

Organizations around the world are now adapting AI for their Electronic Medical Record system in the view to optimise the healthcare process

AI in Smart IoT and wearable devices

AI is being used to analyze data from smart IoT and wearable devices to identify patterns and trends that can be used to improve healthcare



AI in nanomedicine and drug delivery

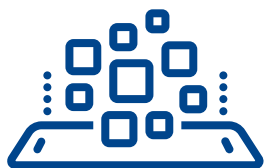
AI in nanomedicine is being widely used in combinations therapies and target drug delivery to optimize efficacy and minimize side effects

AI in Medical image analysis

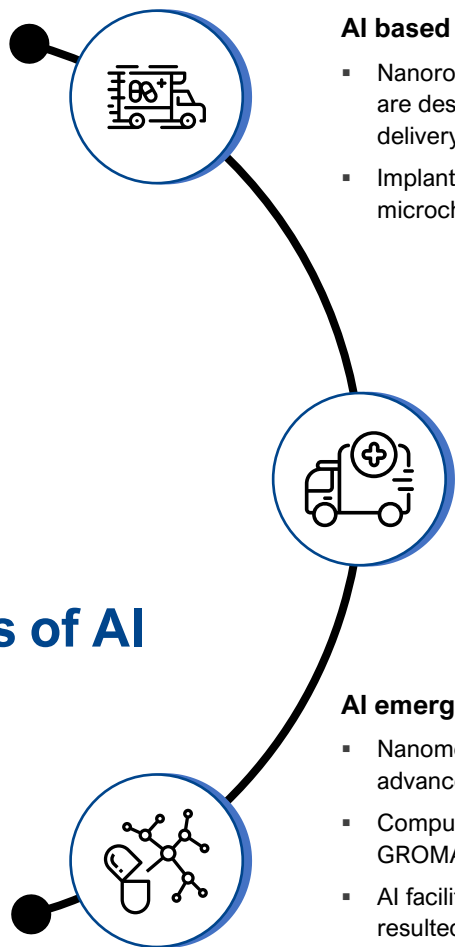
AI's role in medial image analysis using ML algorithms has resulted in improved diagnostic efficacy and patient care

AI in nanomedicine and drug delivery

AI advances in nanomedicine optimize formulations, personalized medicine, & intelligent drug delivery, enhancing efficacy, minimizing side effects, & accelerating therapy development by analyzing complex biological data and predicting drug interactions



Advanced applications of AI



AI based nanobots for drug delivery

- Nanorobots, equipped with integrated circuits, sensors, power supply, & data backup, utilize AI for maintenance. They are designed to navigate, identify targets, attach, & eventually leave the body, thereby advancing targeted drug delivery, optimizing efficacy and minimizing side effects
- Implantable nanorobots utilize AI tools for dose adjustment, sustained release, and automation, often coupled with microchip implants for precise location detection

AI in combination drug delivery

- Combination therapy with synergistic drug combinations is effective for treating complex diseases like TB and cancer. High-throughput screening using AI techniques like ANNs, logistic regression, and network-based modeling can streamline selection process
- Additionally, algorithms like Master Regulator Inference Algorithm & Network-based Laplacian regularized least square predict synergism, thus improving drug delivery

AI emergence in nanomedicine

- Nanomedicines offer enhanced diagnosis, treatment, and monitoring for complex diseases, with potential for further advancements through integration of AI
- Computational methods analyze drug formulations, interactions, & encapsulation, while software like LAMMPS & GROMACS 4 assess surface chemistry's impact on nanoparticle uptake
- AI facilitated development of silicasomes, combining iRGD & irinotecan-loaded mesoporous silica nanoparticles, resulted in increased uptake & improved treatment

Source: Secondary Research, Industry Analysis

AI in Medical image analysis

ML algorithms, like convolutional neural networks, revolutionize medical image analysis across departments, employing diverse imaging techniques (CT, MRI, ultrasound, pathology, fundus, endoscope) for accurate disease diagnosis and severity assessment

Philip Healthcare's IntelliSpace



Philips Healthcare's IntelliSpace Discovery is an open platform fostering AI solutions in healthcare, promoting R&D collaboration in medical imaging & diagnostics.

Additionally, the company is introducing IntelliSite Pathology Solution, digitizing glass slides to enable pathologists for digital tissue sample analysis, improving diagnostic accuracy & efficiency

Siemens Healthineer's AI-Rad Companion



Siemens Healthineers AI-Rad Companion is an AI-powered software suite that enhances diagnostic capabilities in medical imaging.

It assists in diagnosing chest CT scans, automating detection & characterization of chest pathologies, providing quantitative data to improve radiologists' efficiency and accuracy

Artery's Cardio AI, Liver AI, and Lung AI software



Arterys, a healthcare technology company has obtained FDA clearance for its Cardio AI, Liver AI, and Lung AI software, enabling secure access to their Medical Imaging Cloud AI platform. This solution utilizes AI & cloud computing to enhance medical image analysis, improving diagnostic accuracy and patient care

Zebra Medical Vision & Aidoc's AI-based medical image analysis tools



Zebra Medical focuses on early detection & diagnosis of diseases, enhancing radiologists' workflow efficiency, while Aidoc specializes in software that prioritizes & analyzes medical images, improving diagnostic accuracy & reducing turnaround times

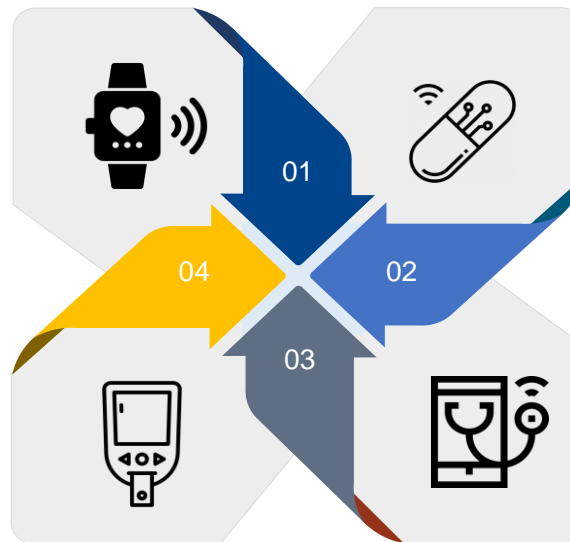
Source: Secondary Research, Industry Analysis

AI in Smart IoT and wearable devices

Players such as Apple, Philips and Medtronic are developing various Smart IoT and wearable devices which can assist in improving user health by acquiring health related information from their daily lives

Apple Watch

Apple watch integrated an FDA-approved DL algorithm which detects atrial fibrillation. By learning users' heart rates at rest & during activity, it warns of significant deviations. The algorithm also demonstrates high accuracy in ECG analysis, making it valuable for patients with cardiovascular disease or chronic kidney disease accompanied by high blood potassium levels



Smart Pill by Proteus Digital Health

The Proteus Smart Pill tracks pill ingestion with sensors and machine learning algorithms, giving real-time feedback to patients and healthcare providers. Swallowing is detected by sensors, transmitted to a patch on the skin, and then to a smartphone app. Machine learning algorithms, trained on patient data, provide accurate medication intake feedback

Medtronic Continuous Glucose Monitoring (CGM)

Medtronic's CGM continuously measures blood sugar levels using ISF sensors inserted under the skin and a transmitter that sends data to a receiver or smartphone app. It employs artificial neural networks to detect patterns in blood sugar levels, such as hypoglycemia, enabling timely alerts and preventive actions for patients

Intellivue Guardian Angel by Philips

The Intellivue Guardian Angel is a wearable device monitoring vital signs and using machine learning algorithms to alert healthcare providers early on, preventing complications and improving patient outcomes by detecting patterns in data indicative of potential problems

Key Players:



Medtronic

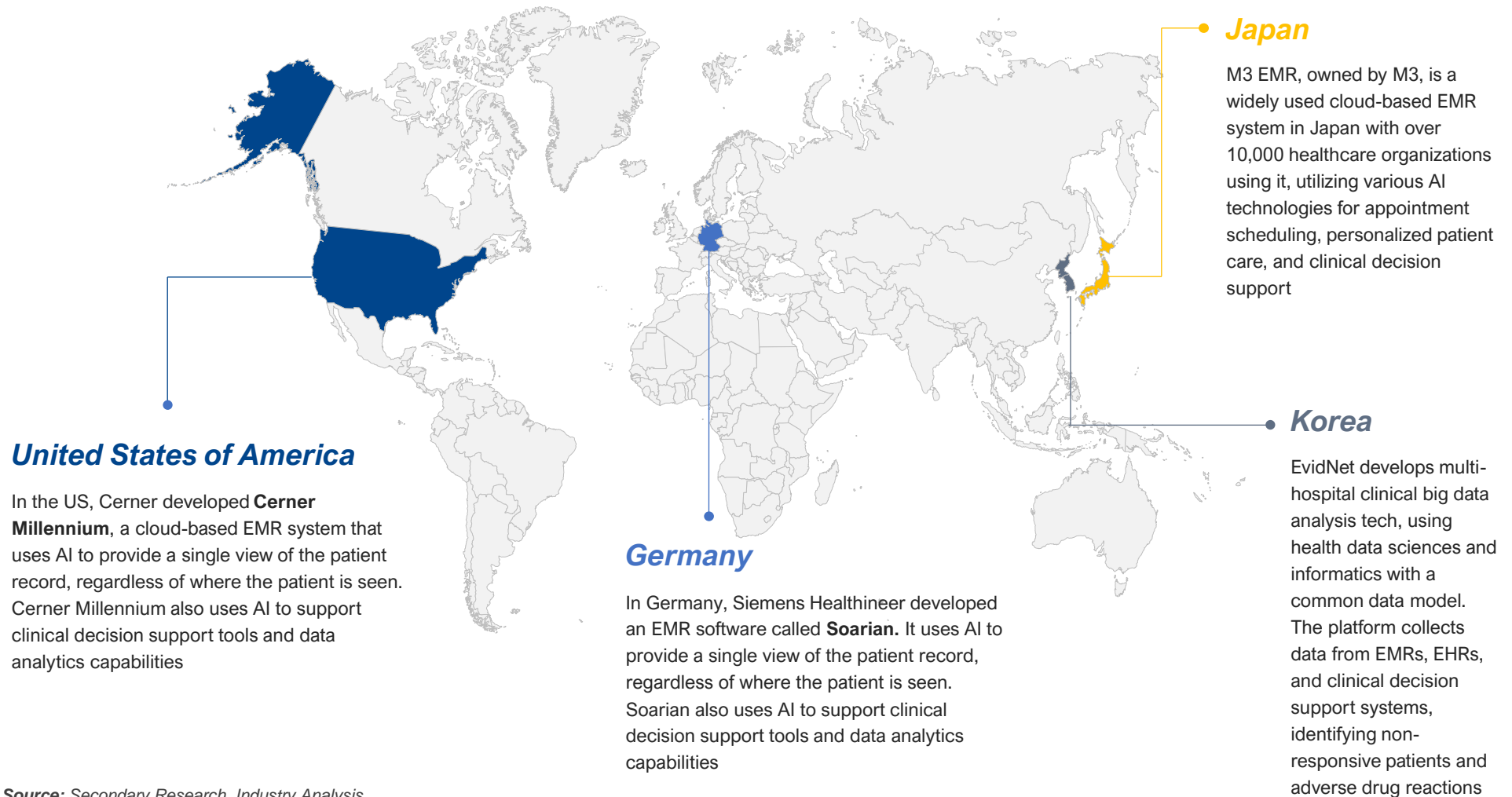
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Source: Secondary Research, Industry Analysis

AI in Electronic Medical Records (EMR)

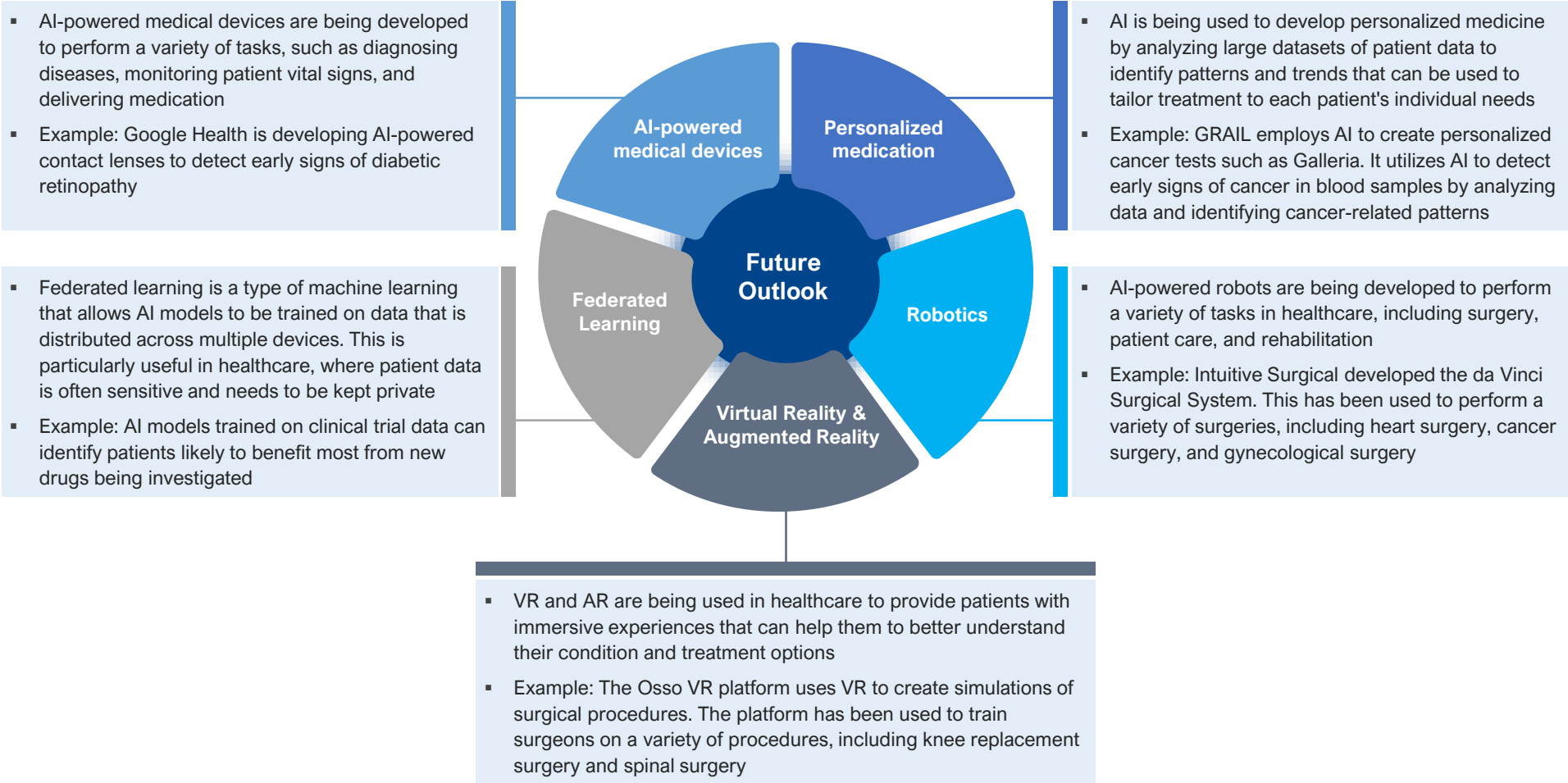
Companies across the world such as EvidNet, Siemens, Cerner and M3 are developing AI based EMRs with an objective of optimizing hospital treatment processes



Source: Secondary Research, Industry Analysis

Future Outlook of AI in Healthcare

The integration of AI in innovations such as Surgical Robotics, Personalized medication as well as Virtual & Augmented Reality has the potential to transform healthcare by improving the quality, efficiency and accessibility of care





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