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**Subject:** CC-309 Introduction to AI and ML

## **Unit1 : Case Study - Creating a New Health Care Market with AI**

### **Outline:**

In the last, five to ten years, AI becoming more advantageous for the healthcare industry and going to have a significant impact on this industry. Healthcare Industries are applying AI to make a better and faster diagnosis than humans. AI can help doctors with diagnosis and can inform when patients are worsening so that medical help can reach to the patient before hospitalization.

### **Techniques:**

Various AI techniques play a critical role in reshaping the healthcare market:

- **Machine Learning (ML):** For analyzing patient data to predict diseases or treatment outcomes.
- **Natural Language Processing (NLP):** To process clinical notes and unstructured data for insights.
- **Computer Vision:** For interpreting medical images like X-rays, MRIs, and CT scans.
- **Robotic Process Automation (RPA):** For automating administrative tasks such as patient scheduling and billing.
- **Deep Learning:** For advanced applications like drug discovery and

genomics analysis.

- **Reinforcement Learning:** For optimizing treatment protocols and operational workflows.

### Use of AI Techniques in Different Healthcare Areas:

- **AI-Powered Diagnostics:** AI algorithms can analyze patient data, such as medical imaging or genomic profiles, to detect diseases early. An AI-based radiology platform analyzes X-rays for early detection of lung cancer, reducing misdiagnosis rates by 30%. Faster and more accurate diagnoses help patients receive timely treatment.
- **Predictive Healthcare:** AI can analyze historical and real-time data to predict health risks. Wearables integrated with AI predict potential heart attacks based on user health patterns. Preventive measures can lower healthcare costs and save lives.
- **Telemedicine Platforms:** AI-enabled platforms can connect patients with healthcare professionals remotely, reducing geographic barriers. A chatbot pre-screens symptoms, triages cases, and refers patients to appropriate specialists. Increases access to care in rural areas and reduces strain on healthcare facilities.
- **Drug Discovery and Development:** AI accelerates drug development by identifying promising compounds and simulating their effects. An AI platform identifies a new treatment for rare diseases within months instead of years. Reduces costs and time-to-market for life-saving medications.
- **Operational Efficiency in Hospitals:** Streamlining Administrative Work and Automating tasks like patient scheduling, billing, and medical record management. Predicting patient inflow and optimizing staff and bed availability.
- **Mental Health Care:** Chatbots and virtual therapists provide cognitive behavioral therapy (CBT) and emotional support. AI

analyzes speech patterns and social media activity to detect early signs of depression or suicidal tendencies.

- **Surgical Assistance:** AI-powered robots like da Vinci Surgical System assist surgeons in performing minimally invasive surgeries with precision. AI analyzes imaging data to help surgeons plan complex procedures in advance.
- **Public Health Management:** AI monitors and analyzes data to predict disease outbreaks (e.g., flu trends or COVID-19 hotspots). AI helps governments and health organizations identify health risks and allocate resources efficiently.
- **Patient Monitoring and Wearables:** Devices like smartwatches use AI to track vitals (e.g., heart rate, oxygen levels) and detect irregularities. AI-enabled platforms help manage conditions such as diabetes or hypertension by tracking glucose levels and blood pressure.

### **Conclusion:**

AI offers transformative opportunities in healthcare by increasing efficiency, reducing costs, and improving outcomes. By addressing challenges and leveraging advanced AI techniques, a sustainable and inclusive healthcare market can be created to meet diverse needs globally.