BUSINESS PROBLEM

Introduction

Healthcare systems play a critical role in improving patient health and saving lives. Hospitals, clinics, and telemedicine platforms provide diagnosis, treatment, and preventive care services.However, one major challenge faced by healthcare providers is patient non-adherence and hospital readmissions. Patients may skip medications, miss appointments, or fail to follow treatment plans, leading to worsening health conditions.

Improving patient retention, treatment adherence, and early risk detection can significantly enhance healthcare quality and reduce operational costs. Data Science and Machine Learning can help identify high-risk patients and enable proactive care interventions.

1. Business Objective:

• Identify patients at high risk of readmission or complications.

• Improve patient follow-up and treatment adherence.

• Enhance personalized patient care.

• Reduce hospital readmission rates.

• Enable preventive healthcare actions such as:

▪ Sending medication reminders

▪ Scheduling follow-up alerts

▪ Providing personalized care plans

▪ Remote health monitoring

▪ Health education notifications

Business Success Criteria

• Reduction in hospital readmission rates (e.g., 15–20%).

• Improved patient recovery outcomes.

• Increased treatment adherence rate.

• Reduced healthcare operational costs.

• Higher patient satisfaction levels.

2. Assess Situation

Inventory of Resources

• Electronic Health Records (EHR).

• Patient medical history data.

• Appointment & follow-up records.

• Lab reports and diagnostic data.

• Wearable device health data (heart rate, BP, glucose).

• Hospital IT systems and cloud infrastructure.

• Healthcare professionals & data analysts.

Requirements

• Accurate prediction of high-risk patients.

• Real-time monitoring for critical conditions.

• Easy-to-understand insights for doctors.

• Secure and privacy-compliant data handling.

Assumptions

• Patient data is accurate and up-to-date.

• Patients follow recommended treatment plans.

• Healthcare infrastructure supports digital monitoring.

Constraints

• Data privacy laws (HIPAA/GDPR compliance).

• Limited data for new patients.

• Integration challenges across hospital systems.

• High cost of advanced healthcare technologies.

Costs

• Data storage and IT infrastructure.

• AI model development and maintenance.

• Remote monitoring equipment.

• Staff training and system integration.

Benefits

• Improved patient health outcomes.

• Early disease detection and prevention.

• Reduced hospital workload.

• Enhanced patient engagement.

• Increased trust and hospital reputation.