Medicare — Smart Hospital Management System (Case Study)

Context: Hospital operations analytics for OPD and appointment management (6 months of event data).

Problem: Long OPD wait times and lack of real-time visibility into bed and appointment utilization.

Goal: Reduce average OPD patient wait time and provide a real-time operations dashboard for hospital admins.

Approach:

- Ingested appointment, registration, and bed allocation logs into a Postgres DB; built ETL scripts (Python) to standardize timestamps and patient flows.
- Performed EDA and root-cause segmentation (by department, appointment type, time of day) using Pandas and SQL.
- Built forecasting and scheduling rules to simulate optimized appointment slots; created automated alerts for bed shortages.
- Developed an interactive Power BI dashboard and integrated features: WebRTC consultations and an AI chatbot for symptom pre-triage.

Results:

- Reduced average OPD wait time by 20% after implementing scheduling adjustments informed by the dashboard.
- Enabled operations team to identify top 3 bottleneck departments within 2 weeks of rollout.
- Increased appointment throughput and improved visibility for admin teams (dashboard adoption by ops staff).

Key takeaway & next steps:

- Data + small scheduling changes produced measurable operational improvement.
- Next: deploy wait-time prediction model and auto-suggest appointment slots; integrate with booking system for live rescheduling.

Tech stack: Python (Pandas), SQL, Power BI, React, WebRTC, simple ML models.

Links & contact:

Demo & code: https://github.com/Rajkumar011111/medicare-hms-case-study • GitHub: Rajkumar011111