

DATA STORYTELLING & PROJECT EXPLANATION DOCUMENT

1. Introduction & Business Problem

Business Problem

The hospital is facing challenges in managing and analyzing its patient, financial, and operational data due to:

- Missing & inconsistent data (patient names, costs, dates)
- Inaccurate & unformatted entries (inconsistent gender, blood type, dates)
- Duplicate records (multiple instances of the same patient or treatment)
- Outliers in financial data (unrealistic treatment & room charges)
- Operational inefficiencies (unnecessary columns, unstructured data)

Project Goal

The objective is to clean the data, remove inconsistencies, and generate actionable insights through Power BI dashboards for Doctors, Patients, Payments, and General Analysis to improve hospital management, billing, and decision-making.

2. Data Cleaning & Preprocessing

To ensure data quality, the following steps were performed in **Power BI**:

1. Handling Missing Data

- Filled missing names with "Unknown"
- Replaced null values in payment status with "Pending"
- Used Fill Down for missing room charges

2. Standardizing Column Values

- Corrected categorical values (e.g., "malee" → "Male", "ICUs" → "ICU")
- Applied proper case formatting for names and categories

3. Formatting Numeric & Date Columns

- Ensured treatment cost & room charges were in INR (₹)
- Standardized dates to DD/MM/YYYY format
- Validated chronological order (e.g., Admission Date < Discharge Date)

4. Removing Duplicates & Outliers

- Removed duplicate patient entries
- Filtered out outliers in financial data (e.g., treatment cost > ₹10,00,000)

Outcome: A **clean, structured dataset** ready for Power BI dashboard analysis.

3. Dashboard Development & Key Insights

A. Doctor Dashboard

Doctor-wise Revenue (Tree Map)

Pending Payments by Doctor (Bar Chart)

Patient Satisfaction per Doctor (Gauge Chart)

Total Patients Treated per Doctor (Bar Chart)

Treatment Duration Analysis (Line Chart)

Insights:

- Identified top revenue-generating doctors
- Tracked high outstanding payments per doctor
- Compared doctor workloads & patient satisfaction

B. Patient Dashboard

Gender Distribution(Pie Chart)

Patient Satisfaction Score by Doctor Assigned (Pie Chart)

Room Type Preference (Bar Chart)

Admissions Over Time (Line Chart)

Patients by Blood Type (Donut Chart)

Insights:

- Majority of patients have O- Blood group
- Average Treatment Cost is ₹51,440
- Semi Private & Private Rooms generate more revenue

C. Payment Analysis Dashboard

Total Cost(₹) by Payment Status (Donut Chart)

Average Treatment Cost by Gender (Funnel)

Total Cost(₹) by Insurance Provider (Column Chart)

Top 5 Patients with Pending Payments (Table)

Revenue by Room Type (Bar Chart)

Insights:

- Pending payments account for 33% of total revenue
- Self-paid patients contribute more revenue than insured ones
- High-value pending payments need urgent follow-up

D. General Dashboard

Patients by Treatment Duration (days) Trend (Line Chart)

Treatment Costs by Disease (Pie Chart)

Room Type Preference (Bar Chart)

Treatment Cost (₹) Vs Room Charges (₹) (Donut Chart)

Satisfaction Trends (Gauge Chart)

Insights:

- Most Patients are treated in 7.5 days
- Dengue and Malaria have the highest treatment costs
- Patient satisfaction is improving over time

4. Conclusion & Recommendations

Key Takeaways:

Improve Insurance Coverage – Many patients pay out-of-pocket; hospitals should promote insurance partnerships.

Follow Up on Pending Payments – Implement automated reminders for overdue bills.

Optimize Doctor Workload – Balance patient distribution among doctors to reduce high workload cases.

Monitor High-Cost Treatments – Investigate why some treatments have exceptionally high costs.

Enhance Patient Satisfaction – Address feedback on long wait times and room conditions.