

# User Requirements Document

**Project Name:** Healthcare Analytics Dashboard (2025)

## Objective

To deliver data-driven insights that improve patient outcomes and hospital efficiency by analysing key healthcare metrics across various departments and demographics.

## Problems Identified

- The Head of Healthcare Operations lacks timely and reliable data insights for monitoring hospital KPIs.
- Existing reporting is fragmented and doesn't enable root cause analysis or forecasting.
- Manual data aggregation and analysis lead to inconsistent insights and delayed decisions.
- The BI team is at full capacity and cannot provide exploratory insights regularly.

## Target Audience

- **Primary:** Head of Healthcare Operations.
- **Secondary:** Hospital department managers, finance departments, and healthcare policy advisors.

## Use Cases

1. Monitor trends in readmission rates and treatment costs.
2. Evaluate average length of stay by department and diagnosis
3. Compare treatment effectiveness across demographics (e.g., age, gender)
4. Identify financial inefficiencies and high-risk patient segments.

## User Stories

As the Head of Healthcare Operations,

I want to evaluate hospital performance metrics such as readmission rates and treatment costs,

So that I can make informed decisions that improve patient outcomes and reduce inefficiencies.

## Acceptance Criteria

The dashboard should:

- Present readmission rates, treatment costs, and length of stay in a filterable dashboard.
- Allow drill-down by department, diagnosis, gender, and age group.
- Provide exportable data and charts for internal reporting.
- Be based on accurate, validated, and timely data.

## Success Criteria

Head of Healthcare Operations can:

- ✓ Quickly identify trends in healthcare performance
- ✓ Uncover demographic disparities in treatment and outcomes
- ✓ Propose data-backed operational changes to improve efficiency
- ✓ Justify funding or staffing decisions with concrete evidence

This enables the organization to meet performance benchmarks and regulatory requirements while improving patient care.

## Information Needed

Key metrics required include:

- Patient ID
- Age, Gender
- Department, Diagnosis
- Admission Date, Discharge Date
- Length of Stay
- Readmission Flag
- Insurance Status
- Cost of Treatment

## Data Needed

Confirmed fields from the dataset:

- Patient\_ID (string)
- Age (integer)
- Gender (string)
- Department (string)
- Diagnosis (string)
- Admission\_Date, Discharge\_Date (dates)
- Readmission (boolean or binary)
- Treatment\_Cost (float), Insurance (string)
- Hospital\_Stay\_Length (int)

## Data Quality Checks

- Validate non-null values in key fields (Age, Diagnosis, Admission\_Date, etc.)
- Check for date inconsistencies (e.g., discharge before admission)
- Confirm numerical columns are in expected ranges (e.g., cost  $\geq 0$ , age  $> 0$ )
- Detect duplicates in Patient\_ID
- Ensure categorical consistency (Gender, Department, Insurance).

## Additional Requirements

- Document preprocessing steps (Python notebook).
- Upload the cleaned dataset and results to GitHub.
- Prepare dashboard using Power BI, with clear segmentation options.
- Provide a summary report for the Head of Healthcare Operations, explaining key insights and recommendations.