AI Health Twin – Power BI Dashboard Documentation

# 1. Documentation

Project Title: AI Health Twin – Power BI Hospital Data Dashboard

Objective / Problem Statement:  
To create a comprehensive and interactive Power BI dashboard that helps healthcare professionals analyze patient demographics, medical conditions, treatment efficiency, costs, satisfaction, and readmission risks using hospital data.

Tools & Technologies Used:  
- Microsoft Power BI Desktop  
- Power Query  
- DAX (Data Analysis Expressions)  
- CSV Dataset

Dataset Description:  
The dataset (`hospital data analysis.csv`) contains patient records with attributes such as age, gender, procedure, condition, cost, length of stay, satisfaction score, readmission status, and outcome.

How to Run the Project:  
1. Open Power BI Desktop.  
2. Load the CSV file via `Get Data > Text/CSV`.  
3. Use `Transform Data` to clean and create calculated columns.  
4. Follow the steps to create visuals like KPI cards, charts, heatmaps, slicers, and interactivity tools.  
5. Polish and publish the report to Power BI Service.

Results Summary:  
The dashboard provides:  
- Key insights on average costs, patient stay, and satisfaction.  
- Condition-wise and procedure-wise analysis.  
- Predictors for readmission and outcomes.  
- User-friendly slicers and drill-throughs for deep data exploration.

Installation Guide:

- Install Power BI Desktop from Microsoft  
- No external libraries required; all transformations and visuals are handled within Power BI

# ✅ Best Practices Followed

- Descriptive file names and folder organization  
- Clean DAX formulas and data model  
- Slicers and interactivity for end-user control  
- README clearly explains how to use the project  
- Published to Power BI Service for collaboration

# 4. Additional Concepts Implemented

Advanced Data Modeling:  
- Relationships established between key fields such as Patient\_ID, Procedure, and Outcome to enable a relational data model.  
- Calculated columns and measures created using DAX to dynamically compute KPIs like Readmission Rate, Avg Cost, and Satisfaction Level.

Custom Visualizations & Insights:  
- KPI Cards summarize key statistics for hospital performance.  
- Heatmaps and matrix visuals used to show correlations between procedure types and satisfaction levels.  
- Smart Narratives and Q&A visual enable natural language querying and auto-generated insights.

Data Transformation Techniques:  
- Power Query used to clean, transform, and engineer new features like AgeGroup and SatisfactionLevel.  
- Conditional columns and custom transformations ensure better segmentation of patient data.

Performance Optimization:  
- Data types were optimized in Power Query to reduce report load time.  
- Measures created in the data model layer reduce redundancy and improve visualization responsiveness.