**Portfolio Project: Hospital Operations Dashboard (SQL + Power BI)**

# **Business Understanding**

## **Overview**

The goal of this project is to analyze hospital operations by integrating patient footfall, financial performance, and lab efficiency data. The project will involve SQL for data extraction, transformation, and analysis, and Power BI for visualization and reporting.

## **Problem Statement**

## **Business Objectives**

### **General Objective**

### **Specific Objectives**

**Patient Flow & Demand Analysis**

1. What is the daily patient volume per department?
2. What are the busiest and least busy departments over time?
3. Are there seasonal or time-based trends in patient visits?

**Financial Performance**

1. How much revenue is generated per department?
2. What are the most common payment modes?
3. What is the correlation between patient footfall and revenue?
4. What are the top revenue-generating services?

**Lab Efficiency & Service Optimization**

1. What is the average turnaround time for lab tests?
2. Which tests are the most frequently requested?
3. How does test urgency affect turnaround time?
4. Which doctors request the most lab tests?

## **Business Success Criteria**

## **Data Understanding**

I used ChatGPT to generate a Python script to create the data.

***The initial prompt:***

*I am looking to create a portfolio project that analyzes a hospital’s operations. Suggest three dashboards that I can utilise SQL and Tableau and SQL with Power BI. Generate random data in csv format for this analysis. Create as many tables as you need to.*

The result was these three tables and respective columns:

1. **patient\_footfall**: patient visits, department utilization, and trends over time

* **date**: date of visit
* **department\_id:** unique department ID
* **department**: department where the patient first landed on the visit day. There are eight (8) departments (General Medicine, Pediatrics, Orthopedics, Cardiology, Radiology, Emergency, Surgery, Maternity)
* **daily\_patient\_count:** number of patients per department per visit

1. **financial\_data:** hospital revenue, patient billing, and department-wise earnings

* **invoice\_id:** unique invoice ID/number
* **patient\_id:** unique patient ID
* **department\_id:** unique department ID
* **department:** department where patient was billed
* **service:** the clinic/service utilised by the patient
* **amount\_billed:** payment expected per service per patient
* **payment\_mode:** cash, insurance corporate
* **paid:** whether the bill is paid or not (Yes/No)

1. **lab\_tests:** lab test requests, turnaround times, and priority level

* **test\_id**: unique lab test ID
* **patient\_id**: unique patient ID
* **doctor**: name of doctor requesting the test
* **test\_type**: name of lab test requested
* **request\_date**: date when doctor made lab test request
* **turnaround\_time\_hrs**: duration between request time and test results
* **urgency**: whether the test was routine or urgent

Inspecting the data to ensure that data types are standardized across the different tables was crucial.

1. **Date Formatting**: I used YYYY-MM-DD format
2. **Departments**: ensured that the departments were the same and were labeled in the same way in the patient\_footfall and financial\_data tables.

## **Exploratory Data Analysis**

### **Univariate Analysis**

### **Bivariate Analysis**

### **Multivariate Analysis**

## **Summary of Findings**

## **Conclusion**

## **Limitations**

## **Recommendations**

## **Future Work**