Milestone 1 – Problem Statement

Project Title:
AI Hotel Revenue Performance Analysis Dashboard using Power BI

🏨 1. Business Context

The hotel industry is highly competitive and influenced by several dynamic factors such as seasonality, customer types, booking channels, and economic trends.
To remain profitable, hotel management must continuously monitor:

- Revenue generation
- Occupancy performance
- Pricing strategy (ADR)
- Booking behavior
- Cancellation impact

Currently, decision-making without data visualization leads to missed opportunities and ineffective revenue management.
This project aims to deliver a **data-driven revenue analysis system** through a visual dashboard using Power BI.

🎯 2. Problem Statement

Hotels struggle to identify:

- Which customer categories contribute the most revenue
- Which booking sources drive better sales vs higher cancellations
- How seasonal changes impact revenue and occupancy
- Which room types generate higher return

Due to lack of interactive metrics, revenue strategies are not optimized.
Hence, the problem is to analyze hotel booking data to determine key factors affecting revenue, enabling better commercial decisions.

🚀 3. Project Objectives

OBJECTIVE	DESCRIPTION
REVENUE PERFORMANCE ANALYSIS	Analyze Total Revenue, ADR, RevPAR & Occupancy trends
IDENTIFY REVENUE DRIVERS	Seasonal impact, booking channels, customer segmentation
EVALUATE CANCELLATIONS	Study how cancellations impact hotel revenue
CREATE A BUSINESS DASHBOARD	Develop an interactive Power BI dashboard for stakeholders
PROVIDE INSIGHTS & RECOMMENDATIONS	Suggest improvements for revenue optimization

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📍 4. Scope of the Project

INCLUDED	EXCLUDED
ANALYSIS OF REVENUE-RELATED KPIS	Profit margin & operational cost analysis
TWO HOTEL CATEGORIES: CITY VS RESORT	External economic or competitor factors
HISTORICAL BOOKING RECORDS ONLY	Real-time revenue automation

DASHBOARD INSIGHTS & DOCUMENTATION	Forecasting or AI-based price optimization

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✳️ 5. Dataset Overview

Dataset Used: **Hotel Booking Demand Dataset** (Kaggle)
Total Records (after cleaning): **~117,399**
Important columns:
- **adr** → Average Daily Rate (Room Price)
- **stays_in_weekend_nights / stays_in_week_nights**
- **customer_type**
- **market_segment**
- **distribution_channel**
- **reservation_status**
- **arrival date details**
- **adults, children, babies** (guest count)

Dataset helps examine real patterns in bookings and revenue.

⚒️ 6. Tools & Technologies

PURPOSE	TOOLS USED
DATA CLEANING	Excel / Python
DATA PROCESSING	Python (Pandas)
DASHBOARD DEVELOPMENT	Microsoft Power BI
VERSION CONTROL	GitHub
DOCUMENTATION	Google Docs / Markdown

📌 7. Expected Outcomes

- Interactive Power BI dashboard with core hotel KPIs
- Clear understanding of revenue patterns
- Identification of high-performing channels, seasons, and guest types
- Actionable business recommendations for revenue optimization

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📝 8. Deliverables (Milestones Roadmap)

MILESTONE	DELIVERABLE
MILESTONE 1	Problem Statement (This Document)
MILESTONE 2	Dataset Selection & Description
MILESTONE 3	Data Cleaning & Preprocessing
MILESTONE 4	Exploratory Data Analysis (EDA)
MILESTONE 5	Power BI Dashboard + Insights Report

✔️ Conclusion

This milestone establishes the purpose of the hotel revenue dashboard project. It clearly defines what problem is being solved and what outcomes will be delivered through further milestones.