

# Project Summary — Hotel Data Analytics Platform

## Hotel Data Analytics Dashboard: Real-Time Insights for Smarter Hospitality Operations

### Overview:

This project delivers a comprehensive and dynamic hotel data analytics solution built in Power BI, powered by a centralized BigQuery backend and DAX-driven visual logic. It transforms raw booking and room availability data into actionable insights for operations, revenue management, and strategic planning.

### Core Objectives:

- Provide real-time and historical visibility into booking trends, revenue, and guest behaviors.
- Support revenue optimization through dynamic pricing, yield analysis, and KPI benchmarking.
- Enable hotel managers to identify performance gaps and opportunities across timeframes, guest segments, and booking channels.

### Key Features:

- **8-Page Dashboard Interface** (work in progress), including:
  - **Daily Performance Summary** (Net Revenue, Occupancy %, ADR, RevPAR — LN, MTD, YTD)
  - **Guest Movements Today** (Arrivals, Departures, Stayovers)
  - **7-Day Forecast** (Occupancy, ADR, Available Rooms, Booking Trends)
  - **Historical Analysis** (Multi-year trends, drill-down by segment)
  - **Market Segmentation** (Booking sources, Guest profiles, Business type)
  - **Pickup & Forecasting** (Day-by-day, segment-level pickup, and pace)
- **Dynamic KPIs** with year-over-year, vs-target, and vs-budget deltas.
- **BigQuery-Powered Views** that pre-aggregate and tag data by flags like isLastNight, isMTD, isYTD, reducing DAX complexity.
- **AI Commentary Engine** embedded with smart comparison logic:
  - ADR vs Target ADR

- RevPAR vs ADR (occupancy vs yield)
- ADR vs Base Rate (discounting patterns)
- **Repeat Guest Detection** and **Visit Tracking**, enabling loyalty and retention analysis.
- **Capacity-Constrained Simulation** of 300,000 room-nights over 2 years, including cancellation and no-show behavior.
- Custom contract rate logic incorporating weekend/season modifiers, guest count, and VAT handling.

#### Technology Stack:

- **Power BI** for visual analytics and dashboarding.
- **Google BigQuery** for cloud-based, scalable SQL processing.
- **DAX** for advanced KPIs, time intelligence, and contextual filters.
- **Python** (during simulation phases) for synthetic guest and booking data generation.

#### Impact:

This project equips hotel decision-makers with daily-ready, accurate, and visually intuitive insights, supporting both operational control and strategic foresight — transforming raw hotel data into a living, breathing business command center.