

Hotel Business Understand and Improve Revenue



Project Statement:

Hotels must understand their occupancy patterns, guest demographics, and pricing effectiveness to improve revenue. This project builds an analytical solution in Power BI to track room bookings, average daily rates, guest profiles, and seasonal trends. It helps hotel management make decisions around promotions, upselling, pricing strategies, and room optimization.

Outcomes:

- Occupancy rate and booking trend dashboards
- ADR (Average Daily Rate) and RevPAR (Revenue Per Available Room) metrics
- Customer segmentation by stay purpose and demographics
- Forecasting of occupancy and revenue based on historical data
- Branch-level performance comparisons
- Strategic dashboard for pricing and marketing actions
- Model scalability across hotel chains and geographies

Modules to be Implemented:

1. Data Modeling and Ingestion

- Load booking, customer, and room data
- Build a star schema with Date, Room, Customer, Hotel branches
- Calculate booking duration, room category, and stay type

2. Occupancy & Revenue Metrics

- Occupancy %, ADR, and RevPAR over time
- Visualize daily, weekly, and seasonal performance
- Compare direct bookings vs. OTA bookings

3. Guest Analysis Module

- Analyze guest types: business, family, solo
- Visuals for nationality, booking source, and duration
- Cluster customers into first-timers, loyal guests, and high spenders

4. Forecasting and Cancellation Trends

- Predict future occupancy using trend lines
- Cancellation rate analysis and lead time distribution
- No-show and refund trend visuals

5. Revenue Strategy Dashboard

- Identify upsell potential (spa, dining, services)
- Recommend pricing tiers by season and room type
- Final interactive dashboard for GMs and revenue managers

Week-wise Module Implementation Plan with Deliverables

Week | Module | Deliverables

1–2 | Data Modeling | Booking and customer data with schema

3–4 | Occupancy & Revenue | KPI visuals with drilldowns

5–6 | Guest Analysis | Demographic segmentation visuals

7–8 | Forecasting | Booking and cancellation trends

9–10 | Strategy Dashboard | Complete dashboard with pricing insights

Evaluation Criteria (Milestone-Based)

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• Milestone 1 (Week 2):

Clean and transformed booking and room data ingested into a star schema. Relationships among customer, booking, and hotel branches are tested and validated.

The screenshot displays a data modeling tool interface. On the left, a star schema diagram is visible with a central fact table 'Fact_Booking' and several dimension tables: 'Dim_Customer', 'Dim_Time', 'Dim_Room', and 'Dim_Location'. The 'Fact_Booking' table is highlighted. On the right, a data table is shown with columns: 'Booking_ID', 'Customer_ID', 'Room_ID', 'Location_ID', 'Booking_Date', 'Booking_Time', 'Booking_Status', 'Room_Type', 'Room_Rate', 'Location_Name', and 'Customer_Name'. The table contains 20 rows of data, including booking details, customer information, and room specifications.

Booking_ID	Customer_ID	Room_ID	Location_ID	Booking_Date	Booking_Time	Booking_Status	Room_Type	Room_Rate	Location_Name	Customer_Name
000000001	000000001	000000001	000000001	01-12-2021	10:00	Booked	Single	100	Hotel A	John Doe
000000002	000000002	000000002	000000002	01-12-2021	11:00	Booked	Double	150	Hotel B	Jane Smith
000000003	000000003	000000003	000000003	02-12-2021	12:00	Booked	Single	100	Hotel C	Mike Johnson
000000004	000000004	000000004	000000004	02-12-2021	13:00	Booked	Double	150	Hotel D	Sarah Brown
000000005	000000005	000000005	000000005	03-12-2021	14:00	Booked	Single	100	Hotel E	David Wilson
000000006	000000006	000000006	000000006	03-12-2021	15:00	Booked	Double	150	Hotel F	Emily Davis
000000007	000000007	000000007	000000007	04-12-2021	16:00	Booked	Single	100	Hotel G	Chris Miller
000000008	000000008	000000008	000000008	04-12-2021	17:00	Booked	Double	150	Hotel H	Alice Taylor
000000009	000000009	000000009	000000009	05-12-2021	18:00	Booked	Single	100	Hotel I	Bob White
000000010	000000010	000000010	000000010	05-12-2021	19:00	Booked	Double	150	Hotel J	Grace Green
000000011	000000011	000000011	000000011	06-12-2021	20:00	Booked	Single	100	Hotel K	Frank Black
000000012	000000012	000000012	000000012	06-12-2021	21:00	Booked	Double	150	Hotel L	Chloe Grey
000000013	000000013	000000013	000000013	07-12-2021	22:00	Booked	Single	100	Hotel M	Ben Blue
000000014	000000014	000000014	000000014	07-12-2021	23:00	Booked	Double	150	Hotel N	Mia Yellow
000000015	000000015	000000015	000000015	08-12-2021	00:00	Booked	Single	100	Hotel O	Noah Purple
000000016	000000016	000000016	000000016	08-12-2021	01:00	Booked	Double	150	Hotel P	Liam Pink
000000017	000000017	000000017	000000017	09-12-2021	02:00	Booked	Single	100	Hotel Q	Olivia Brown
000000018	000000018	000000018	000000018	09-12-2021	03:00	Booked	Double	150	Hotel R	Ethan Green
000000019	000000019	000000019	000000019	10-12-2021	04:00	Booked	Single	100	Hotel S	Ava Blue
000000020	000000020	000000020	000000020	10-12-2021	05:00	Booked	Double	150	Hotel T	Lucas Yellow

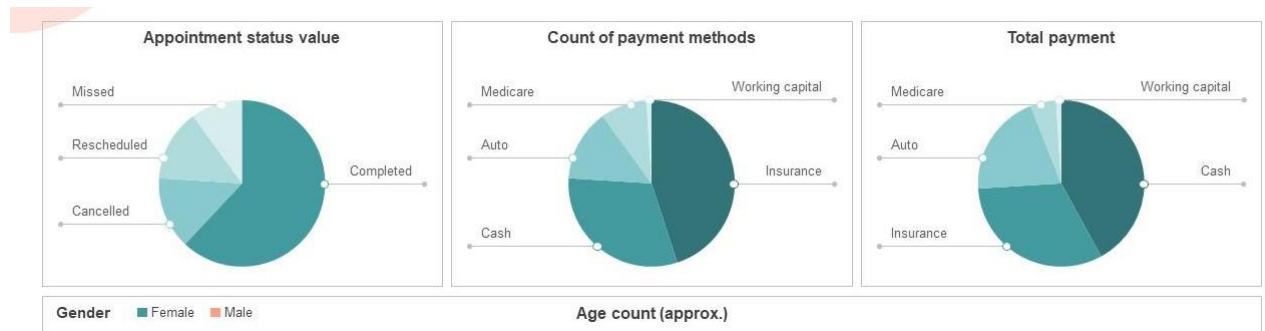
- **Milestone 2 (Week 4):**

Occupancy % and revenue metrics (RevPAR, ADR) are visualized over time. Interactive filtering by room type, location, and booking source is fully functional.



- **Milestone 3 (Week 6):**

Guest segmentation is operational based on purpose of visit, demographics, and loyalty. Persona insights are available in dashboard view



- **Milestone 4 (Week 8):**

Forecasting of future occupancy and cancellations using historical data is complete. Dashboard includes booking lead time analysis and refund/cancellation heatmaps.

- **Milestone 5 (Week 10):**

Revenue strategy dashboard includes recommendations for pricing tiers, upsell offers, and seasonal promotions. Final reports and delivery assets are ready.



4. Forecasting & Cancellation

- ⚡ Predict future occupancy using **trend lines**
- 📅 Cancellation rate analysis and lead time distribution
- 💸 No-show and refund trend visuals



5. Revenue Strategy Dashboard

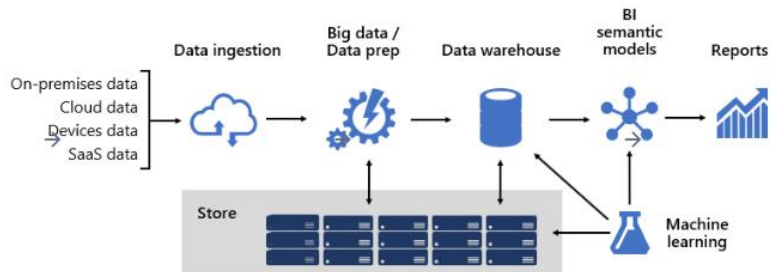
- 🛒 Identify **upsell potential** (spa, dining, services)
- 📊 Recommend pricing tiers by season and room type
- 🏢 Final interactive dashboard for GMs and revenue managers



Architecture Diagram

- **Data Sources:** Booking engines, Hotel CRM, Channel managers
- **Transformation:** Power Query
- **Modeling Layer:** Guest, Booking, Room, Date
- **Visualization Layer:** Occupancy, Revenue, Guest Profiles

Architecture Diagram



Data Sources

Booking engines, Hotel CRM,
Channel managers



Transformation

Power Query for data cleaning
and preparation



Modeling Layer

Guest, Booking, Room, Date
dimensions



Visualization Layer

Occupancy, Revenue, Guest
Profiles