

Pro Host



DEPI – Graduation Project

Google Data Analytics Track

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01

Introduction



ERP?!

CRM?!

PMS?!

ERP?!

An integrated management system that connects all departments of an organization such as finance, inventory, procurement, and human resources to streamline operations and centralize data.

CRM?!

A system designed to manage and enhance customer relationships by tracking interactions, supporting sales and marketing activities, and improving customer service and loyalty.

PMS?!

A specialized system used in hospitality to manage daily hotel operations, including reservations, room management, guest profiles, billing, and housekeeping from a unified platform.



Pro Host

A unified platform designed specifically for the hospitality sector that combines the operational control of an ERP system, the guest-relationship capabilities of a CRM system, and the daily hotel-management functions of a PMS. It centralizes reservations, room operations, finance, inventory, guest profiles, and service interactions into one ecosystem, enabling hotels to streamline workflows, improve decision-making, and deliver a personalized guest experience.





02

Workflow



ERD – Entity Relationship Diagram

During this phase, we built the foundational structure of the **ProHost** database by designing a complete data model that reflects a real hotel environment:

- ✓ Defining the Business Domain
- ✓ Identifying Core Entities
- ✓ Defining Attributes for Each Entity
- ✓ Defining Entity Relationships
- ✓ Designing the Final ERD



ERD

Synthetic
DATA

SQL



Data Source

During this phase, the team spent over a month searching for real hotel datasets across multiple platforms such as Kaggle, GitHub, and open data portals.

However, most datasets were incomplete, outdated, or not detailed enough to support a full PMS simulation.

Because of this limitation, we decided to generate **Synthetic Data** tailored specifically to the project requirements.

Workflow



ERD

Synthetic
DATA

SQL



What is Synthetic Data?

Synthetic data is artificially generated data created using scripts or algorithms to mimic the structure and behavior of real-world data without using any actual personal or sensitive information.



Workflow



ERD

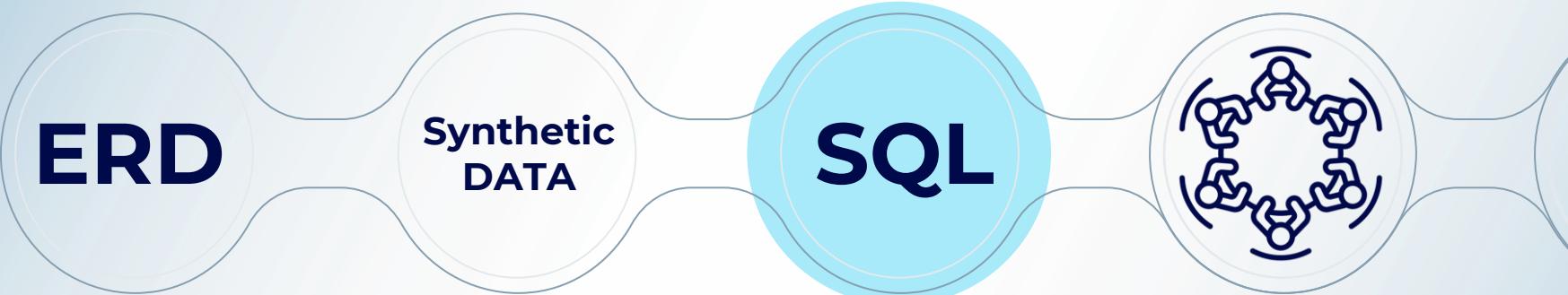
Synthetic
DATA

SQL



Key Advantages of Synthetic Data

- Solves the problem of unavailable or limited real datasets.
- Ensures complete privacy since no real guest information is used.
- Highly flexible, allowing customization to match any business scenario.
- Easy to scale, whether you need thousands or millions of records.



SQL – Database Construction

After completing the ERD design and defining the data source, we moved to the implementation phase where we built the actual database structure and loaded all datasets.

SQL Types Used in This Phase:

1. DDL – Data Definition Language
2. DML – Data Manipulation Language



ERD

Synthetic
DATA

SQL



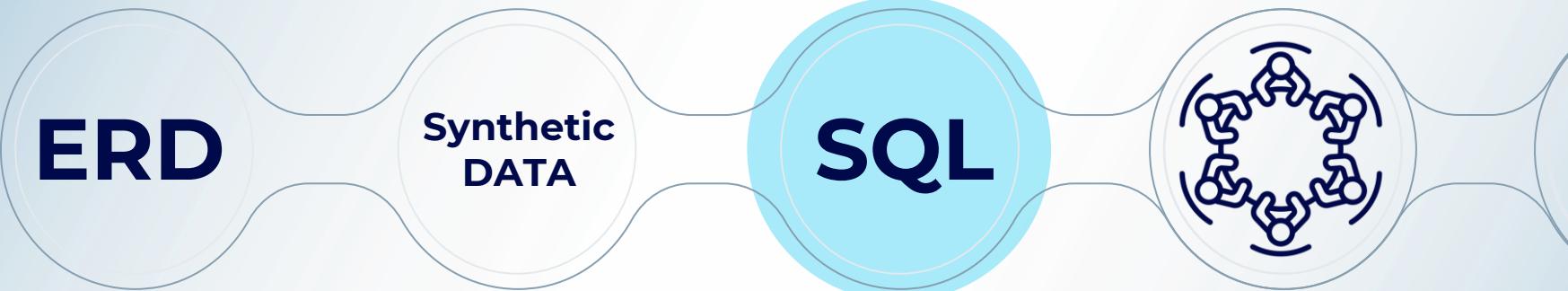
1. DDL – Data Definition Language

Used to create and structure the database components:

- CREATE DATABASE
- CREATE SCHEMA
- CREATE TABLE
- ALTER TABLE (for PKs, FKs, and constraints)
- DROP / TRUNCATE (when rebuilding structures)



Workflow



ERD

Synthetic
DATA

SQL



2. DML – Data Manipulation Language

Used to load and manipulate data inside tables:

- INSERT INTO
- UPDATE
- DELETE



Schema Structure

The database was organized into three main Schemas:

- **Operations** – rooms, room pricing, services, billings, service usage...
- **Guests** – guest profiles, reservations, preferences, feedback...
- **Employees (HR)** – departments, positions, employees, shifts.



ERD

Synthetic
DATA

SQL



Stakeholder Analysis

Once the database was fully structured and the system was considered operational inside a hotel environment, the next step was identifying the target audience for our analytics output.

The goal was to understand their needs, interests, and the type of reports required to support decision-making.



Workflow

ERD

Synthetic
DATA

SQL



Identified Stakeholders

Stakeholder	Role / Responsibility	Expected Benefits
Hotel Management	Oversees hotel operations and strategic planning	High-level dashboards summarizing performance, financial results, and customer satisfaction
Finance Manager	Manages budgeting, cost control, and profitability	Detailed reports on revenue, expenses, and profit by department
Public Relations Manager	Handles guest feedback and brand reputation	Access to satisfaction analysis and sentiment trends

Workflow

ERD

Synthetic
DATA

SQL



Communication Plan

- **Hotel Management:** Monthly strategic KPI dashboards
- **Finance Manager:** Financial reports and YoY/MoM analysis
- **PR Manager:** NPS, service ratings, and feedback insights

Workflow

EDA



EDA – Exploratory Data Analysis

EDA is the first step to understanding the dataset before cleaning, modeling, or visualization. Its purpose is to:

- ✓ Explore the structure of the data
- ✓ Identify missing values and errors
- ✓ Detect outliers
- ✓ Understand distributions
- ✓ Ask initial analytical questions
- ✓ Evaluate data quality

EDA



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EDA



Data Cleansing

Data cleansing is a critical phase in the project, where raw data is transformed into clean, consistent, and analysis-ready datasets.

- ✓ Fixing data types
- ✓ Removing duplicates
- ✓ Handling missing values
- ✓ Replacing abbreviations with descriptive labels
- ✓ Normalizing and standardizing fields
- ✓ Cleaning text (trim, remove invisible characters)
- ✓ Ensuring consistency across related tables
- ✓ Preparing relationships for analysis

Workflow

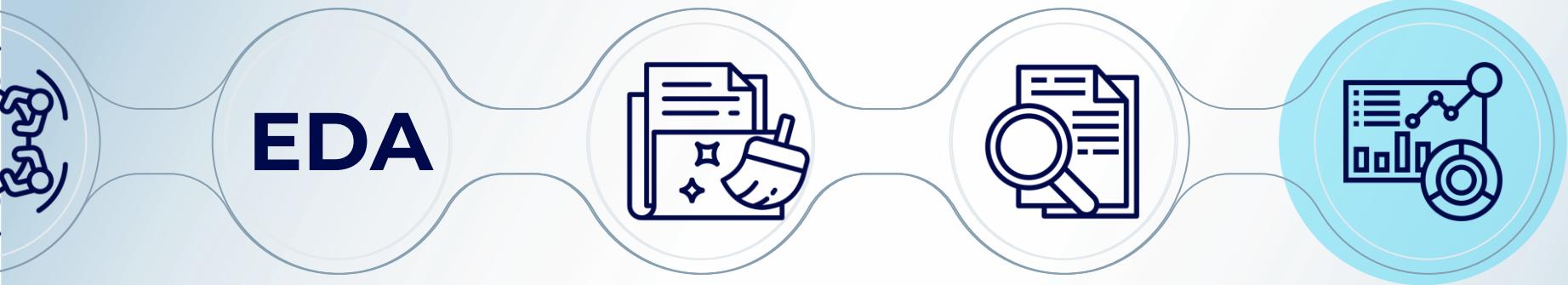
EDA



Data Analysis

After completing the data cleansing stage, we entered the Data Analysis phase, where the prepared datasets were explored to answer key business questions and extract meaningful insights.

- ✓ Studying KPIs for each module
- ✓ Identifying trends
- ✓ YoY and MoM comparisons
- ✓ Building DAX Measures and Calculated Columns
- ✓ Detecting patterns and correlations
- ✓ Answering analytical questions defined earlier
- ✓ Preparing insights for visualization



EDA



Dashboards & Data Visualization

Once all analyses were completed, the final phase was building the Power BI dashboards, transforming the insights into clear, visually intuitive reports tailored for decision-makers.

The objective was to deliver strategic year-end dashboards comparing 2025 vs. 2024, covering the hotel's operational, financial, and customer experience performance.



Workflow



03

Final Results

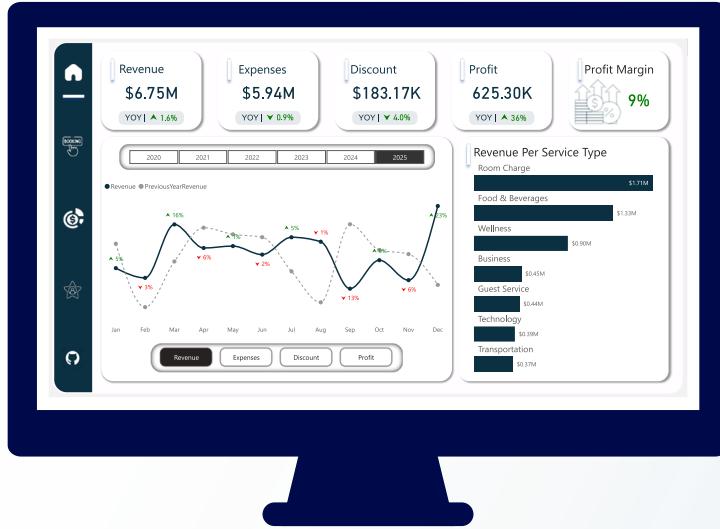
Results



Yasmin Omar

Financial Dashboard

This dashboard shows the hotel's revenue, profit, expenses, discounts, and payment status for 2025, helping management understand financial performance in a clear and easy way.





Revenue

\$6.75M

YOY | ▲ 1.6%

Expenses

\$5.94M

YOY | ▼ 0.9%

Discount

\$183.17K

YOY | ▼ 4.0%

Profit

625.30K

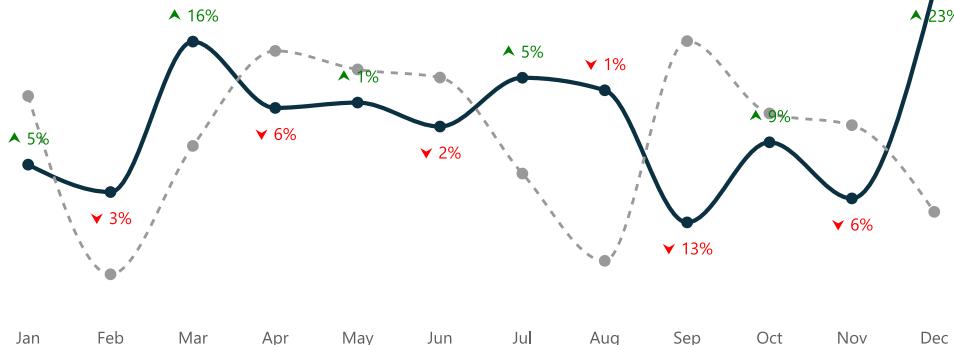
YOY | ▲ 36%

Profit Margin

9%

2020 2021 2022 2023 2024 2025

● Revenue ● PreviousYearRevenue



Revenue

Expenses

Discount

Profit

Revenue Per Service Type

Room Charge

\$1.71M

Food & Beverages

\$1.33M

Wellness

\$0.90M

Business

\$0.45M

Guest Service

\$0.44M

Technology

\$0.39M

Transportation

\$0.37M



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2020 2021 2022 2023 2024 2025

● Expenses ● PreviousYearExpenses



Revenue

Expenses

Discount

Profit

Expenses Per Category

Salaries & Wages \$3.5M

Food & Beverage Costs \$0.6M

Utilities \$0.5M

Marketing & Advertising \$0.3M

Insurance \$0.3M

Technology & Software \$0.2M

Administrative Expenses \$0.2M

Maintenance & Repairs \$0.2M

Cleaning Supplies \$0.1M

Training & Development \$0.1M



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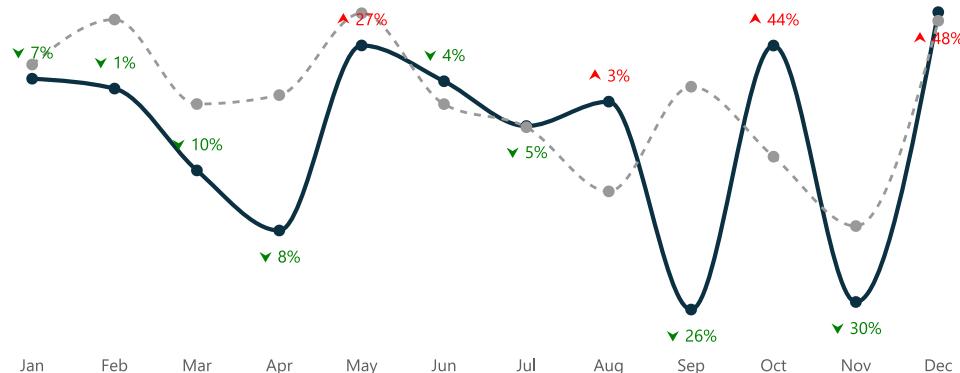
YOY | ▲ 36%

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9%

2020 2021 2022 2023 2024 2025

● Discounts ● PreviousYearDiscounts



Revenue

Expenses

Discount

Profit

Revenue & Discount Rate For Each Payment Method

Credit Card 2.48%



Bank Transfer 2.89%



Cash 2.57%



Corporate Account 3.26%





Revenue

\$6.75M

YOY | ▲ 1.6%

Expenses

\$5.94M

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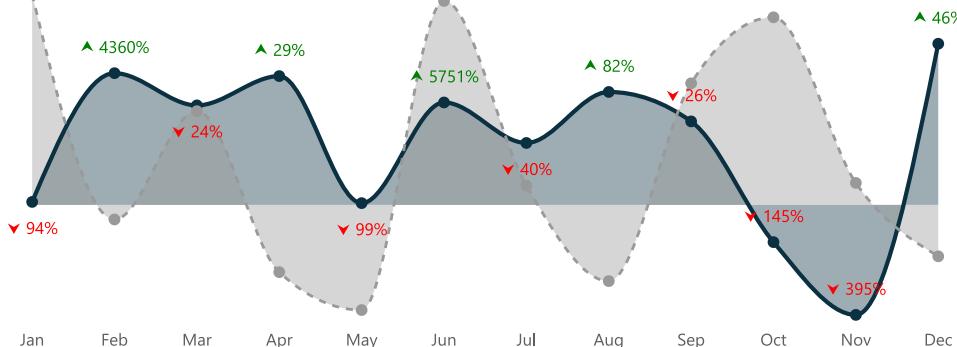
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Profit Margin

9%

2020 2021 2022 2023 2024 2025

● Profit ● PreviousYearProfit



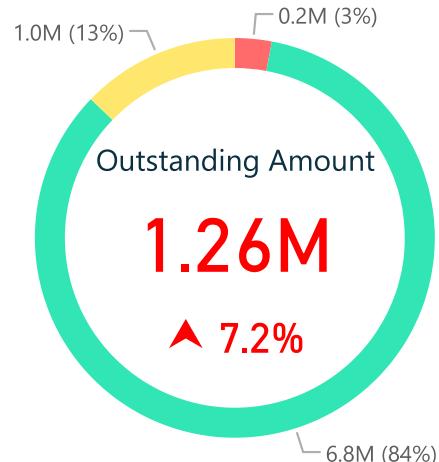
Revenue

Expenses

Discount

Profit

Payment Status Distribution



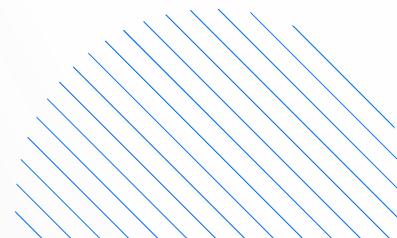
● Overdue ● Paid ● Pending

Overall Key Findings

- Total revenue was \$6.75M, with a +1.6% YOY growth.
- Revenue had ups and downs across months, with strong months like Dec, Mar, and Jul.
- Top revenue services were Room Charge, Food & Beverages, and Wellness.
- Total profit was \$625K, with a strong +36% YOY increase and a 9% profit margin.
- Some months had losses, especially Oct and Nov.
- Outstanding amount was \$1.26M, with a +7.2% increase from last year.
- Most payments were Paid, but Pending and Overdue were still high.
- Total discounts were \$183K (-4% YOY).
- Corporate accounts had the highest discount rate (3.26%).
- Total expenses were \$5.94M, slightly lower by -0.9% YOY.
- Highest expense categories were Salaries, F&B Costs, and Utilities.
- Expense spikes happened in Oct and Nov.

Overall Recommendations

- Focus on improving weak revenue months, especially April and September.
- Keep investing in Rooms, F&B, and Wellness, as they bring most revenue.
- Reduce losses in October and November through better cost control.
- Improve collection processes to reduce Pending and Overdue payments.
- Review and lower Corporate Account discounts where possible.
- Use higher discounts only in slow months to support demand.
- Control high expenses—especially Salaries, F&B, and Utilities—with better planning.
- Monitor high-expense months and avoid unnecessary spending in Oct and Nov.



Results



Hazem Mustafa
Shahd Mohammed

Reservations Performance

This dashboard shows the hotel's reservation trends for 2025, including monthly changes, booking behavior, and performance across channels, room types, and meal plans



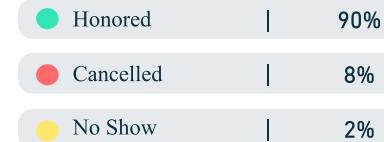


Reservations

14K



YOY | ▼ 2.2%



Booked For

Individuals
59%

Adults
17K



BookingChannels

Booked For

Families
41%

Children
8288

Adults
12K



AVG-Leading Time

12.83

▲ 0.9%

AVG-Length of Stay

2.56

▼ 0.3%

AVG-Room Price

\$330

▲ 0.5%

2020

2021

2022

2023

2024

2025

All

Preferred Room Type

Standard Double

4.7K

Deluxe Double

4.6K

Standard Single

3.1K

Junior Suite

1.1K

Presidential Suite

0.4K

Preferred Meal Plan

Bed & Breakfast

4.2K

Full board

3.5K

Half board

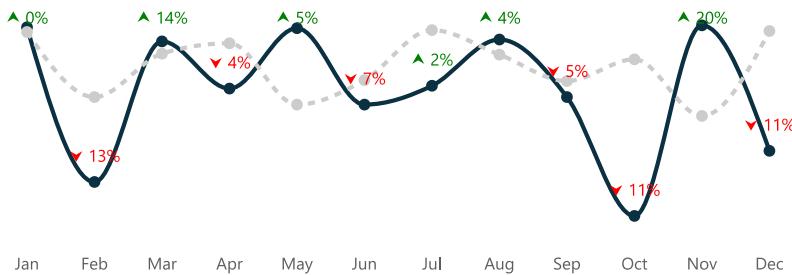
3.5K

Bed Only

2.8K

Reservations Vs. Time

● Reservations ● Previous Year Reservations



Reservations

Pricing

Accommodation

Lead Time

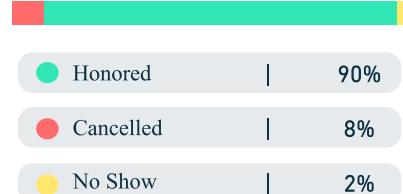


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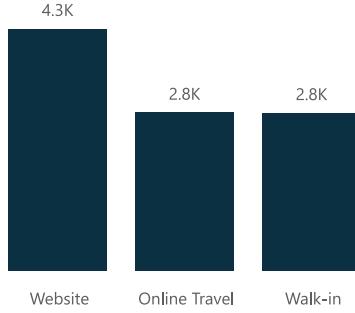
Half board

3.5K

Bed Only

2.8K

Bookings by Channel



Booking Channels

Booked For

AVG-Room Price Vs. Time

● AVG-RoomPrice ● AVG-Pricing For Last Year



Reservations

Pricing

Accommodation

Lead Time

All

▼

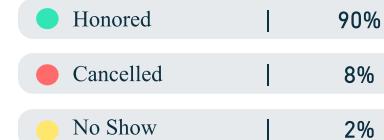


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Bed Only

2.8K

AVG-Length of Stay Vs. Time

● AVG-Accommodation Rate ● AVG-Accommodation Rate For Last Year



Reservations

Pricing

Accommodation

Lead Time

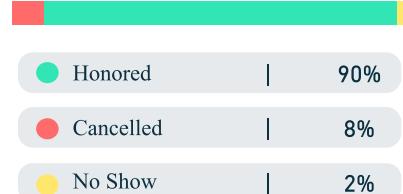


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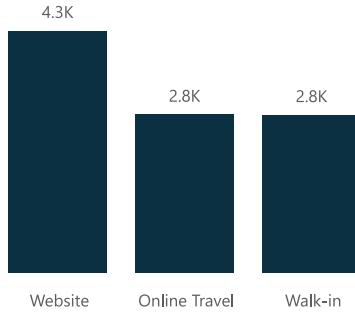
Bed Only

2.8K

Bookings by Channel

BookingChannels

Booked For



AVG-Leading Time Vs. Time

● AVG-LeadingTime ● AVG-LeadingTime For Last Year



Reservations

Pricing

Accommodation

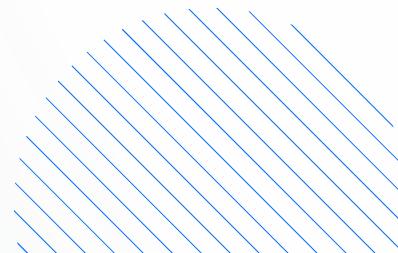
Lead Time

Overall Key Findings

- Total reservations in 2025 were ≈14K, slightly down -2.2% YoY.
- Average room price was \$330, slightly up +0.5% YoY.
- Average booking lead time: ≈12.8 days, slightly higher +0.9% YoY.
- Average length of stay: ≈2.6 days, slightly down -0.3% YoY.
- Booking channels: Website largest source (4,257), Corporate lowest (2,048).
- Meal plans: Bed & Breakfast most popular (4,226), Bed Only least (2,796).
- Room types: Standard and Deluxe most booked; Presidential Suite least booked.
- Seasonal trends: Peaks in reservations in Nov & Mar; low months Feb & Oct.
- Room price peaks: Feb & Apr, lowest in Oct.

Overall Recommendations

- Target low-performing months (Feb, Oct) with promotions and campaigns.
- Encourage early bookings in months with low lead time.
- Promote longer stays in short-length months (May, Oct, Dec).
- Focus on growing Corporate and Phone bookings via offers/loyalty.
- Promote Full Board and Half Board meal plans to balance demand.
- Offer packages for Junior & Presidential Suites to increase high-end sales.
- Maintain stable pricing but review low-price months to avoid revenue loss.



Results



Mariam Taha
Shrouk Abdelwence

Customers Satisfaction

This dashboard shows how customers rated their experience in 2025. It includes the total respondents, NPS score, monthly ratings, top services, age groups, and nationalities. It helps us understand what customers like and where we need to improve.





Respondents

4346



YOY | ▼ 3.0%



Over All Rating

3.5

Females

50.0%

Males

50.0%

Promoters

47%

▼ 12%

Passives

41%

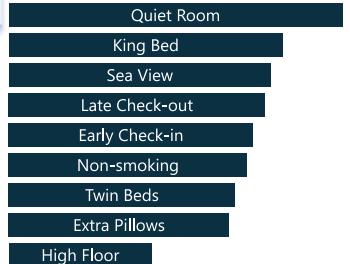
▲ 18%

Detractors

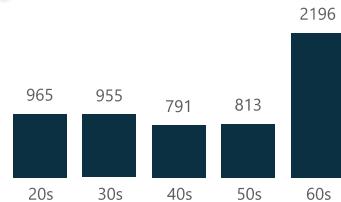
12%

▲ 1%

Guests Regular Requests



Customers Vs. Age Groups

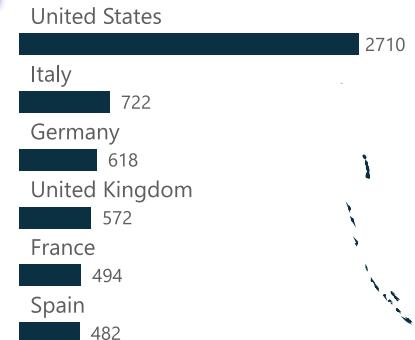


New Customers Acquisition Rate Vs. Time

● New Customers ● Previous Year Rate



Customers By Countries



Rating Vs. Time

Rating Vs. Services

Nationalities



Respondents

4346



YOY | ▼ 3.0%



Over All Rating

3.5

Females

50.0%

Males

50.0%

Promoters

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▼ 12%

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41%

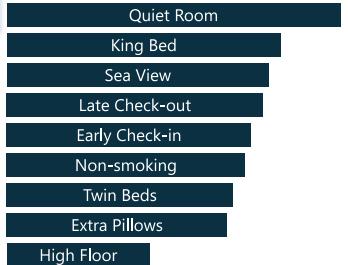
▲ 18%

Detractors

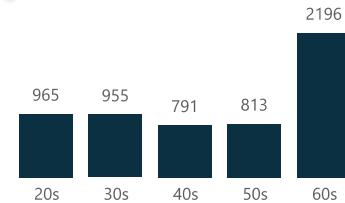
12%

▲ 1%

Guests Regular Requests



Customers Vs. Age Groups



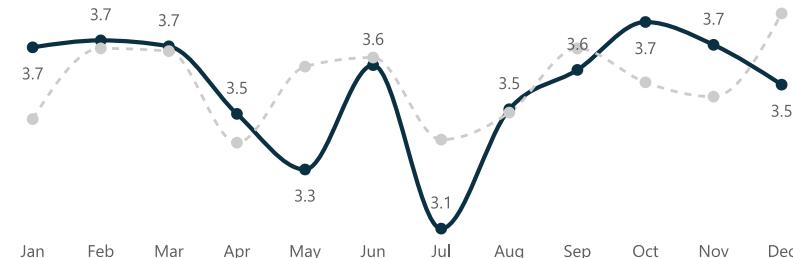
New Customers Acquisition Rate Vs. Time

● New Customers ● Previous Year Rate



Over All Average Rating Vs. Time

● AVG-Rating ● AVG-Previous Year Rating



Rating Vs. Time

Rating Vs. Services

Nationalities



Respondents

4346



YOY | ▼ 3.0%



★ Over All Rating | 3.5

● Females | 50.0%

● Males | 50.0%

Promoters

47%

▼ 12%

Passives

41%

▲ 18%

Detractors

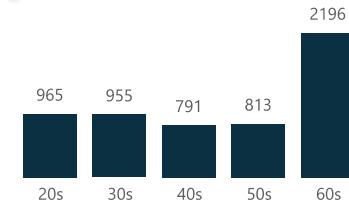
12%

▲ 1%

Guests Regular Requests



Customers Vs. Age Groups



New Customers Acquisition Rate Vs. Time

● New Customers ● Previous Year Rate



ServiceType ServiceName
Guest Service

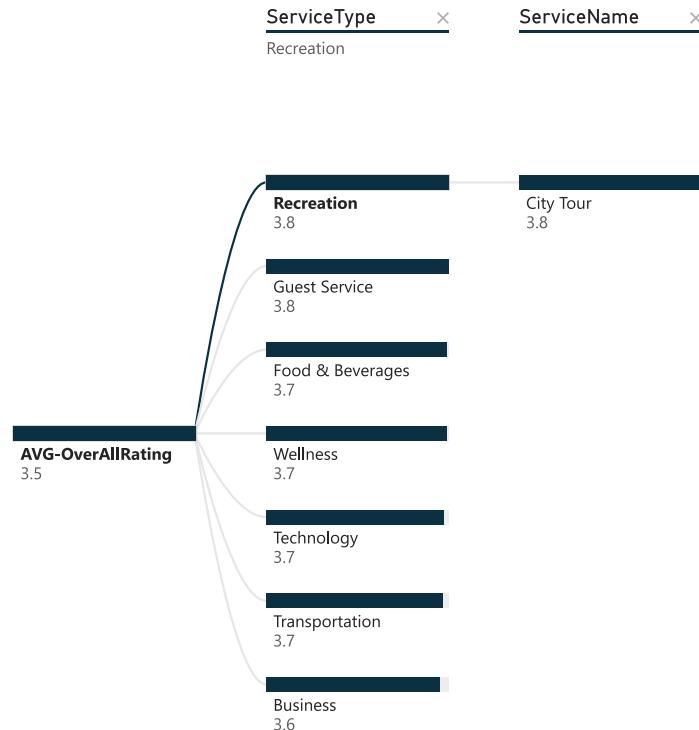


Rating Vs. Time

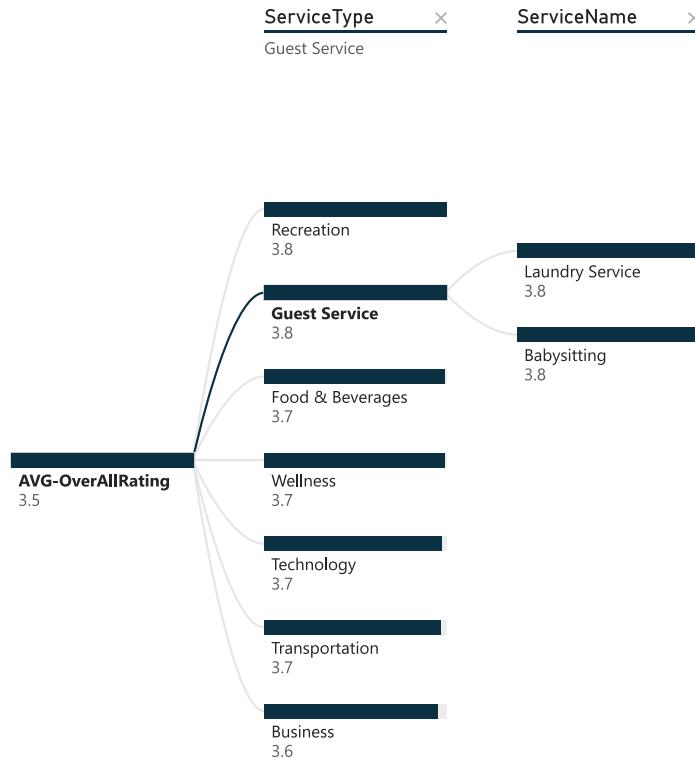
Rating Vs. Services

Nationalities

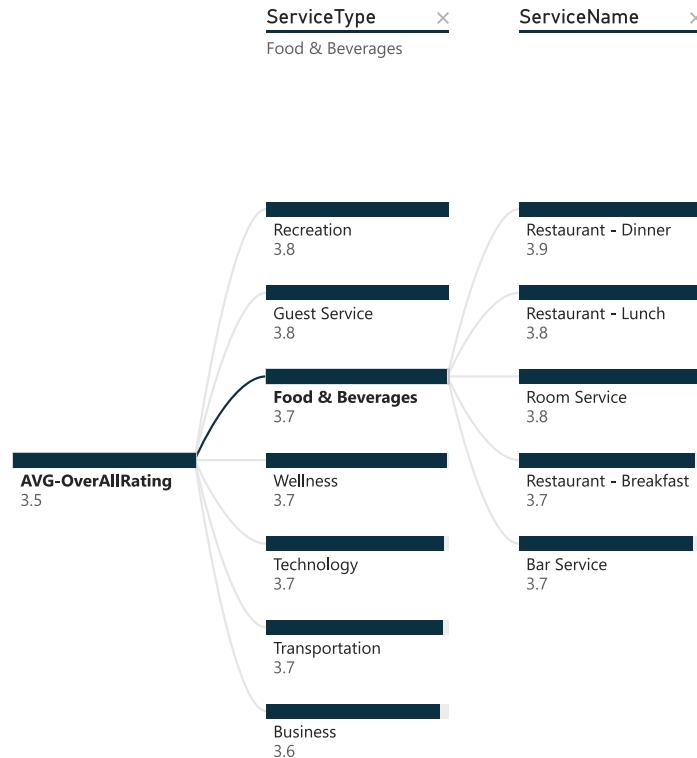
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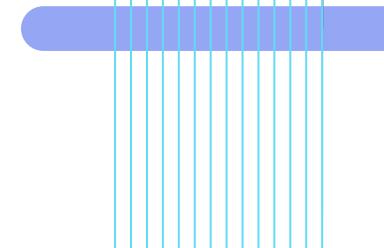
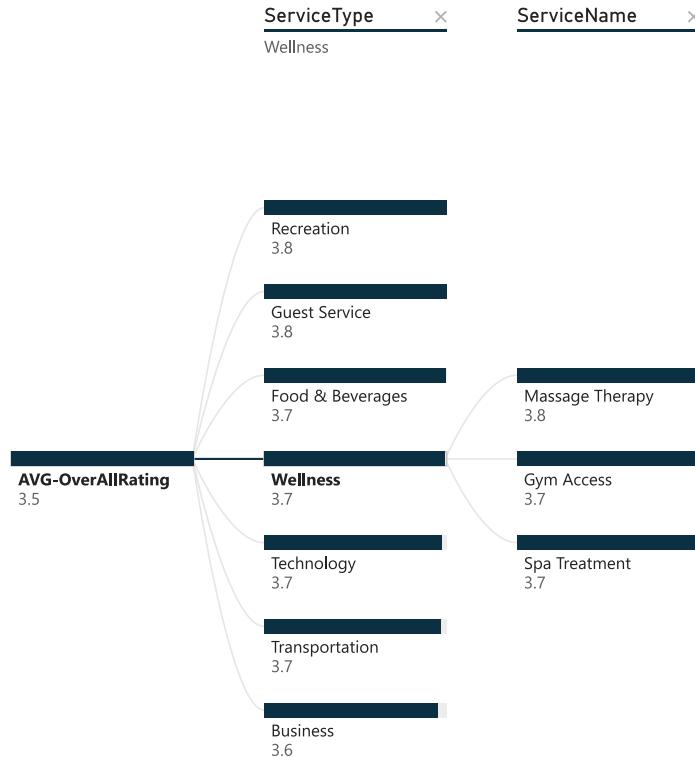
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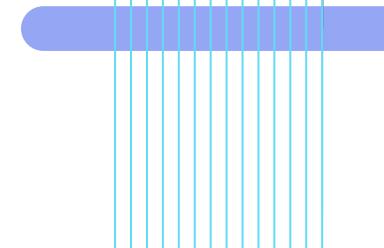
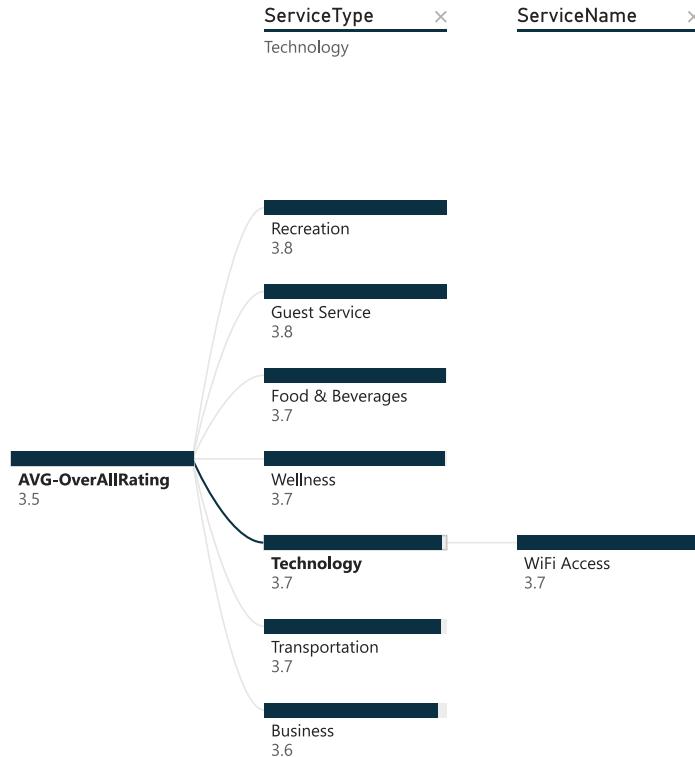
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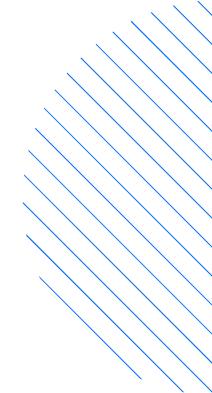
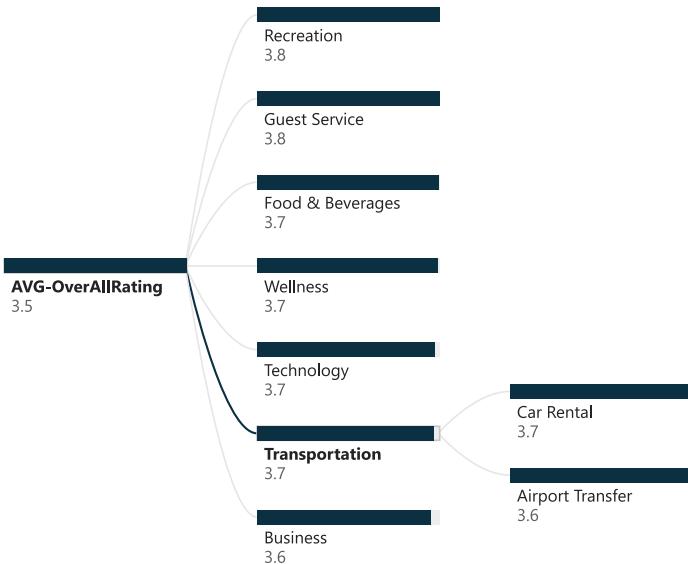


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ServiceType ×

Transportation

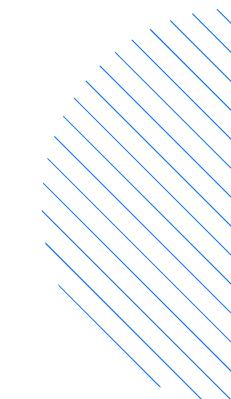
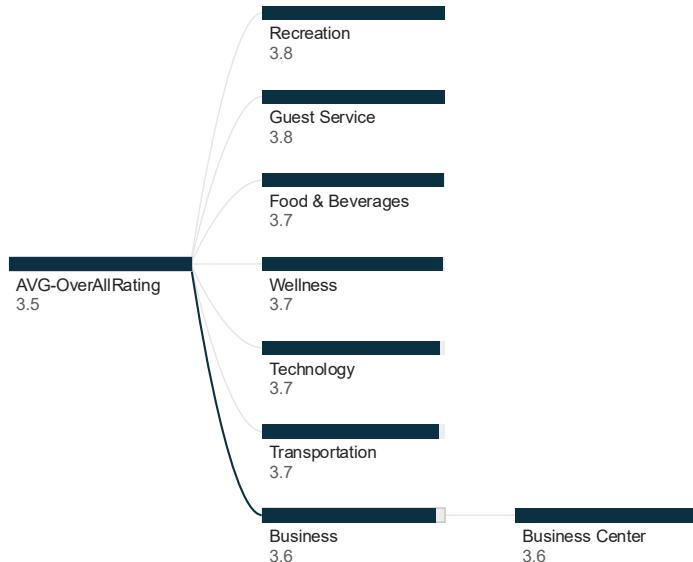
ServiceName ×



Back to report

ServiceType ×
Business

ServiceName ×

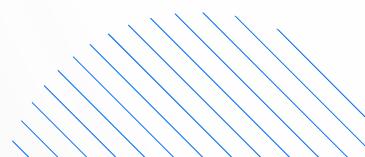


Overall Key Findings

- Total respondents: 4,346, slightly down -3% from 2024.
- Gender split is even: 50% female, 50% male.
- NPS: 3.5/5; Promoters decreased to 47%, Passives rose to 41%.
- Largest age group: 60s (2,196 respondents).
- US guests dominate (2,710), followed by Italy, Germany, UK.
- Most common guest requests: Quiet Room, King Bed, Late Check-out.
- Monthly ratings: best in Jan, Oct, Nov (3.7), lowest in May, Jul, Dec.
- Service ratings: Food & Beverages highest (3.75), Transportation & Business lowest (~3.60).
- New customer acquisition: higher in Jan, Mar, Jul; lower in Aug, Nov, Dec.

Overall Recommendations

- Focus on increasing Promoters and moving Passives to Promoters.
- Target communication and offers for the US market and 60s age group.
- Improve Transportation and Business Center services.
- Maintain strong performance in Food & Beverages and Wellness services.
- Plan for guest requests: ensure quiet rooms, King beds, Sea view availability.
- Investigate months with lower ratings (May, Jul, Dec) and low customer acquisition (Aug, Nov, Dec).
- Use high-performing months as a model for improving weak months.





Thank You

For Reaching This Point we Hope You Found The Analysis Insightful

We'd love to hear your thoughts, feedback, or suggestions