

Infosys Springboard Virtual Internship 6.0 Completion Report

Individual Details:

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Start Date: 13th October, 2025

End Date: 13th December, 2025

Internship Duration: 8 Weeks + 2 Weeks

Subject: Data Visualization

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I. Project Title:

HotelRevAI : AI-Driven Revenue Analysis for Hotels

II. Project Objective:

The primary objective of the **HotelRevAI – AI-Driven Revenue Analysis for Hotels** project is to design and implement an intelligent analytics system that enables hotels to monitor, analyze, and optimize their revenue and occupancy performance using data-driven insights.

The specific objectives of the project are as follows:

- To collect, integrate, and structure hotel booking, customer, and room-level data into a well-defined analytical data model suitable for reporting and analysis.
- To calculate and analyse key hospitality performance indicators such as **Occupancy Rate, Average Daily Rate (ADR), and Revenue per Available Room (RevPAR)** across different time periods.
- To study guest behaviour patterns by analysing booking sources, guest types, nationality, length of stay, and spending behaviour.
- To identify customer segments such as first-time guests, repeat customers, and high-value guests using clustering techniques.
- To analyse booking trends, cancellation behaviour, lead time patterns, and no-show rates to support operational planning.
- To forecast future occupancy trends and demand patterns to assist hotel management in proactive decision-making.
- To develop an interactive, role-based dashboard that provides actionable revenue strategy insights for General Managers (GMs) and Revenue Managers (RMs).

III. Project Description in Details:

HotelRevAI is an AI-driven revenue analytics solution designed to help hotels make informed strategic decisions by transforming raw booking and customer data into meaningful business insights. The system integrates multiple datasets including booking details, customer information, room attributes, and hotel branch data to build a unified analytical foundation.

The project begins with data ingestion and modeling, where raw data is cleaned, transformed, and organized into a **star schema** consisting of fact tables and dimension tables such as Date, Room, Customer, and Hotel Branch. Derived metrics such as booking duration, stay type, and room category are calculated to enrich the dataset.

Using this structured data, the system computes essential hotel performance metrics including **Occupancy Percentage, ADR, and RevPAR**, enabling analysis of daily, weekly, monthly, and seasonal performance. Comparative analysis between **direct bookings and Online Travel Agency (OTA) bookings** helps assess distribution channel effectiveness.

The Guest Analysis module focuses on understanding customer behavior by analyzing guest demographics, booking patterns, nationality distribution, and stay duration. Customers are further segmented into meaningful clusters such as business travellers, family guests, loyal customers, and high spenders to support targeted marketing and personalization strategies.

The Forecasting and Cancellation module analyzes historical trends to predict future occupancy levels, identify high-risk cancellation periods, and study lead time distributions. Visual insights into no-show trends and refund patterns help hotels reduce revenue leakage and improve forecasting accuracy.

Finally, the **Revenue Strategy Dashboard** consolidates all insights into an interactive Power BI dashboard designed for hotel decision-makers. The dashboard highlights upselling opportunities, seasonal pricing recommendations, and room-type-based revenue strategies, enabling hotel management to improve profitability and operational efficiency.

IV. Timeline Overview:

Week	Activities Planned	Activities Completed
Week 1	<ul style="list-style-type: none"> • Project kick-off • Understanding hotel revenue management concepts • Identifying data requirements 	<ul style="list-style-type: none"> • Conducted project initiation • Finalized project scope • Identified key KPIs such as: <ul style="list-style-type: none"> ◦ Occupancy %, ◦ ADR ◦ RevPAR • Reviewed hotel datasets.
Week 2	<ul style="list-style-type: none"> • Data collection • Initial data modelling • Booking, customer, and room datasets preparation 	<ul style="list-style-type: none"> • Collected booking, customer, room, and hotel branch data • Performed initial data cleaning • Data validation
Week 3	<ul style="list-style-type: none"> • Designe analytical data model • Built star schema 	<ul style="list-style-type: none"> • Designed and implemented star schema • Created Fact Bookings table • Built Dimension tables (Date, Room, Customer, Hotel Branch)
Week 4	<ul style="list-style-type: none"> • KPI calculation • Occupancy analysis • Revenue analysis 	<ul style="list-style-type: none"> • Calculated key KPIs (Occupancy %, ADR, RevPAR) • Developed daily performance visuals • Built weekly performance analysis • Created seasonal performance insights
Week 5	<ul style="list-style-type: none"> • Guest analysis • Demographic segmentation planning 	<ul style="list-style-type: none"> • Analyzed guest types (business, family, solo) • Evaluated nationality distribution • Reviewed booking sources • Studied stay duration patterns
Week 6	<ul style="list-style-type: none"> • Customer segmentation • Behavioural analysis 	<ul style="list-style-type: none"> • Clustered customers into segments (first-time, loyal, high spenders) • Validated segmentation insights
Week 7	<ul style="list-style-type: none"> • Forecasting analysis • Cancellation trend analysis 	<ul style="list-style-type: none"> • Analyzed booking trends and cancellation rates • Examined lead time distribution and no-show patterns • Created trend-based forecasts
Week 8	<ul style="list-style-type: none"> • Advance forecasting • Trend visualization 	<ul style="list-style-type: none"> • Refined occupancy trend analysis • Integrated cancellation and refund visuals into dashboard

Week 9	<ul style="list-style-type: none"> Identify revenue strategies Integrate strategies into dashboard 	<ul style="list-style-type: none"> Identified upselling opportunities Analyzed seasonal pricing strategies Generated room-type-based revenue insights
Week 10	<ul style="list-style-type: none"> Completed final dashboard Prepared documentation Submitted project 	<ul style="list-style-type: none"> Developed end-to-end interactive Power BI dashboard Finalized project documentation Prepared project presentation

V(i). Key Milestones:

Milestone	Description	Date Achieved
Project Kickoff	<ul style="list-style-type: none"> Conducted initial project briefing Finalized project objectives Understood hotel revenue analytics concepts Identified datasets and key KPIs 	Week 1
Data Model Completion	<ul style="list-style-type: none"> Completed data cleaning and transformation Implemented star schema with fact and dimension tables 	Week 2
KPI Dashboard Prototype	<ul style="list-style-type: none"> Developed core occupancy and revenue metrics (Occupancy %, ADR, RevPAR) Conducted time-based performance analysis 	Week 3
Guest Analysis Module Review	<ul style="list-style-type: none"> Completed guest demographic analysis Generated booking source insights Segmented customers into meaningful clusters 	Week 4
Forecasting & Trend Analysis Completion	<ul style="list-style-type: none"> Implemented booking trend analysis Analyzed cancellation behaviour Examined lead time distribution Developed occupancy forecasting visuals 	Week 5
Final Submission & Presentation	<ul style="list-style-type: none"> Fully integrated all modules into a single interactive dashboard Finalized documentation Prepared project presentation 	Week 6

V(ii). Project Execution Details:

The execution of the **HotelRevAI** project followed a modular and structured approach. Initial phases focused on data understanding, cleaning, and transformation using analytical best practices. The data model was designed to ensure scalability and efficient reporting.

Key performance metrics were calculated using business logic aligned with hospitality industry standards. Visual analytics were created using interactive charts, slicers, and drill-down features to allow dynamic exploration of data. Forecasting trends were derived using historical patterns and trend lines to support future planning.

The final dashboard integrates operational, analytical, and strategic views, enabling hotel stakeholders to monitor performance, identify revenue opportunities, and optimize pricing and distribution strategies effectively.

VI. Snapshots/Screenshots:

Module-1 - Data Modelling and Ingestion

Dataset Used:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1	StayDate	Room Booked Count	Revenue	Room Available Count	Occupancy %	ADR	REVpar											
2	01-01-2020	18																
3	02-01-2020	45																
4	03-01-2020	64																
5	04-01-2020	82																
6	05-01-2020	102																
7	06-01-2020	114																
8	07-01-2020	125																
9	08-01-2020	144																
10	09-01-2020	160																
11	10-01-2020	172																
12	11-01-2020	181																
13	12-01-2020	176																
14	13-01-2020	189																
15	14-01-2020	184																
16	15-01-2020	188																
17	16-01-2020	189																
18	17-01-2020	196																
19	18-01-2020	190																
20	19-01-2020	192																
21	20-01-2020	202																
22	21-01-2020	203																
23	22-01-2020	217																
24	23-01-2020	201																
25	24-01-2020	203																
26	25-01-2020	213																
27	26-01-2020	220																
28	27-01-2020	232																
29	28-01-2020	238																
30	29-01-2020	237																
31	30-01-2020	224																
32	31-01-2020	224																
33	01-02-2020	219																
34	02-02-2020	222																
35	03-02-2020	225																
36	04-02-2020	232																
37	05-02-2020	225																
38	06-02-2020	225																
39	07-02-2020	223																
40	08-02-2020	219																
41	09-02-2020	214																

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R				
1	BookingID	CustomerID	RoomTypeID	BranchID	DateID	CheckinDate	CheckoutDate	Duration	RoomType	Revenue	BookingStatus	CancellationReason	Lastline	PaymentMethod	DiscountApplied	BookingChannel	Purpose	StayType	SourceType	GuestType	RoomNightsSold	CustomerCluster
1	BR00002	RT001	HB05	DD00002	05-01-2020	11-01-2020	10	Standard - Single Bed	10000	Checked-in	1	Cash	5%	Travel Agent	Business	Long Stay	OTA	Business	10	High Spender		
2	BR00003	CT8474	RT001	DD00003	05-01-2020	06-01-2020	1	Standard - King Bed	10000	Checked-in	3	Credit Card	0%	Website	Vacation	Medium Stay	Direct	Solo	5	High Spender		
3	BR00004	RT001	HB05	DD00004	05-01-2020	06-01-2020	1	Executive - Queen Bed	10000	Checked-in	4	Credit Card	0%	Travel Agent	Business	Long Stay	OTA	Business	0	Medium Spender		
4	BR00005	CT3214	RT001	HB01	DD00005	05-01-2020	13-01-2020	11	Standard - King Bed	20000	Checked-in	5	Cash	5%	Website	Holiday	Long Stay	Direct	Family	11	High Spender	
5	BR00006	OD2918	RT001	HB01	DD00006	05-01-2020	08-01-2020	7	Deluxe - Queen Bed	17500	No>Show	1	Credit Card	0%	Call Center	Holiday	Medium Stay	OTA	Solo	0	Medium Spender	
6	BR00007	CT4412	RT001	HB01	DD00007	05-01-2020	09-01-2020	11	Executive - Queen Bed	15000	Checked-in	2	Cash	5%	Call Center	Conference	Short Stay	OTA	Solo	13	Medium Spender	
7	BR00008	OD2919	RT001	HB09	DD00008	05-01-2020	06-01-2020	1	Executive - Single Bed	10000	Checked-in	3	UPI	5%	Website	Vacation	Medium Stay	Direct	Business	5	High Spender	
8	BR00009	CT2939	RT001	HB09	DD00009	05-01-2020	12-01-2020	11	Standard - King Bed	22000	Checked-in	4	UPI	0%	Travel Agent	Business	Long Stay	OTA	Solo	12	High Spender	
9	BR00010	CT2940	RT001	HB04	DD00010	05-01-2020	04-01-2020	5	Executive - Single Bed	15000	Checked-in	5	UPI	0%	Call Center	Vacation	Short Stay	OTA	Solo	3	First Timer	
10	BR00011	CT3554	RT001	HB04	DD00011	05-01-2020	05-01-2020	1	Executive - King Bed	40000	Checked-in	6	UPI	0%	Travel Agent	Business	Long Stay	OTA	Solo	8	High Spender	
11	BR00012	CT2941	RT001	HB01	DD00012	05-01-2020	05-01-2020	1	Deluxe - King Bed	40000	Checked-in	7	Cash	5%	Call Center	Vacation	Short Stay	OTA	Solo	2	First Timer	
12	BR00013	CT2942	RT001	HB05	DD00013	05-01-2020	12-01-2020	11	Standard - King Bed	22000	No>Show	8	UPI	0%	Travel Agent	Business	Long Stay	OTA	Solo	0	High Spender	
13	BR00014	CT7232	RT001	HB01	DD00014	05-01-2020	13-01-2020	12	Standard - King Bed	24000	Checked-in	1	Cash	5%	Travel Agent	Vacation	Long Stay	OTA	Solo	12	High Spender	
14	BR00015	CT2943	RT001	HB01	DD00015	05-01-2020	05-01-2020	1	Executive - Queen Bed	48000	Checked-in	2	Credit Card	20%	Corporate Account	Business	Extended Stay	Direct	Solo	14	Low Guest	
15	BR00016	CS0519	RT008	HB02	DD00016	05-01-2020	15-01-2020	10	Executive - Queen Bed	48000	Checked-in	3	UPI	0%	Travel Agent	Business	OTA	Business	7	Low Guest		
16	BR00017	CT7095	RT001	HB01	DD00017	05-01-2020	08-01-2020	7	Standard - Single Bed	7000	Checked-in	4	Credit Card	0%	Website	Vacation	Medium Stay	Direct	Solo	0	Low Guest	
17	BR00018	CT3818	RT001	HB02	DD00018	05-01-2020	16-01-2020	14	Standard - Single Bed	14000	No>Show	5	UPI	20%	Website	Holiday	Extended Stay	Direct	Family	0	High Spender	
18	BR00019	CT2940	RT001	HB02	DD00019	05-01-2020	05-01-2020	10	Standard - King Bed	12000	Checked-in	6	UPI	0%	Travel Agent	Business	Medium Stay	OTA	Business	8	High Spender	
19	BR00020	CT3628	RT001	HB02	DD00020	05-01-2020	05-01-2020	1	Executive - King Bed	40000	Checked-in	7	Cash	5%	Call Center	Vacation	Short Stay	OTA	Solo	8	Low Guest	
20	BR00021	CT2941	RT001	HB01	DD00021	05-01-2020	05-01-2020	1	Executive - King Bed	40000	Checked-in	8	UPI	0%	Travel Agent	Business	Medium Stay	OTA	Solo	2	First Timer	
21	BR00022	CT2942	RT004	HB02	DD00022	05-01-2020	04-01-2020	1	Deluxe - Single Bed	40000	Checked-in	9	Credit Card	0%	Corporate Account	Business	Extended Stay	Direct	Solo	0	Medium Spender	
22	BR00023	CT2943	RT001	HB01	DD00023	05-01-2020	05-01-2020	1	Standard - King Bed	6000	Checked-in	10	Credit Card	0%	Travel Agent	Business	Short Stay	OTA	Business	2	First Timer	
23	BR00024	CT2944	RT001	HB01	DD00024	05-01-2020	04-01-2020	2	Standard - King Bed	6000	Cancelled	11	Credit Card	0%	Call Center	Vacation	Short Stay	OTA	Business	0	Low Guest	
24	BR00025	CT2945	RT001	HB01	DD00025	05-01-2020	05-01-2020	3	Standard - King Bed	6000	Checked-in	12	Credit Card	0%	Call Center	Holiday	Short Stay	OTA	Business	0	Low Guest	
25	BR00026	CT2946	RT001	HB01	DD00026	05-01-2020	05-01-2020	4	Executive - King Bed	18000	Cancelled	13	Credit Card	0%	Call Center	Vacation	Medium Stay	OTA	Business	0	Low Guest	
26	BR00027	CT2947	RT001	HB01	DD00027	05-01-2020	07-01-2020	4	Executive - King Bed	18000	Cancelled	14	Credit Card	0%	Call Center	Holiday	Medium Stay	OTA	Business	0	Low Guest	
27	BR00028	CT2948	RT001	HB02	DD00028	05-01-2020	10-01-2020	6	Executive - Queen Bed	28000	Checked-in	15	Credit Card	0%	Call Center	Vacation	Medium Stay	Direct	Business	6	Medium Spender	
28	BR00029	CT2949	RT001	HB02	DD00029	05-01-2020	05-01-2020	1	Deluxe - Queen Bed	18000	Checked-in	16	Credit Card	0%	Call Center	Holiday	Short Stay	OTA	Business	0	Low Guest	
29	BR00030	CT2950	RT001	HB02	DD00030	05-01-2020	14-01-2020	12	Executive - Queen Bed	42000	No>Show	17	Credit Card	0%	Call Center	Vacation	Medium Stay	Direct	Family	4	High Spender	
30	BR00031	CT2951	RT001	HB03	DD00031	05-01-2020	14-01-2020	13	Deluxe - King Bed	40000	Cancelled	18	Credit Card	0%	Call Center	Holiday	Short Stay	OTA	Family	2	First Timer	
31	BR00032	CT2952	RT001	HB01	DD00032	05-01-2020	05-01-2020	1	Standard - King Bed	600												

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
BookingID	CustomerID	RoomTypeID	BranchID	DateID	CheckInDate	CheckOutDate	Duration	Revenue	DayRevenue	MonthStart	StayDate						
1	BK00001	06350	RT03	HB06	000001	01-01-2020	02-01-2020	1	2000	01-01-2020	01-01-2020						
2	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	01-01-2020					
3	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	01-01-2020					
4	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	01-01-2020					
5	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	03-01-2020					
6	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	04-01-2020					
7	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	05-01-2020					
8	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	06-01-2020					
9	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	07-01-2020					
10	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	08-01-2020					
11	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	09-01-2020					
12	BK00002	C00321	RT01	HB05	000002	01-01-2020	11-01-2020	10	10000	10000	01-01-2020	10-01-2020					
13	BK00003	C18474	RT03	HB03	000003	01-01-2020	06-01-2020	5	10000	2000	01-01-2020	01-01-2020					
14	BK00003	C18474	RT03	HB03	000003	01-01-2020	06-01-2020	5	10000	2000	01-01-2020	02-01-2020					
15	BK00003	C18474	RT03	HB03	000003	01-01-2020	06-01-2020	5	10000	2000	01-01-2020	03-01-2020					
16	BK00003	C18474	RT03	HB03	000003	01-01-2020	06-01-2020	5	10000	2000	01-01-2020	04-01-2020					
17	BK00003	C18474	RT03	HB03	000003	01-01-2020	06-01-2020	5	10000	2000	01-01-2020	05-01-2020					
18	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	01-01-2020					
19	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	02-01-2020					
20	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	03-01-2020					
21	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	04-01-2020					
22	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	05-01-2020					
23	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	06-01-2020					
24	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	07-01-2020					
25	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	08-01-2020					
26	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	09-01-2020					
27	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	10-01-2020					
28	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	11-01-2020					
29	BK00004	C16989	RT07	HB08	000004	01-01-2020	13-01-2020	12	36000	3000	01-01-2020	12-01-2020					
30	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	01-01-2020					
31	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	02-01-2020					
32	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	03-01-2020					
33	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	04-01-2020					
34	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	05-01-2020					
35	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	06-01-2020					
36	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	07-01-2020					
37	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	08-01-2020					
38	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	09-01-2020					
39	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	10-01-2020					
40	BK00005	C32124	RT03	HB01	000005	01-01-2020	12-01-2020	11	22000	2000	01-01-2020	11-01-2020					
41	BK00006	C00291	RT05	HB01	000006	01-01-2020	08-01-2020	7	17500	2500	01-01-2020	01-01-2020					

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	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P		
1	CustomerID	Name	Email	Phone	Gender	LoyaltyTier	AgeGroup	Nationality	Country									
2	C00001	Vivan Kumar	vivankumar6@gmail.com	7341119455	Male	Gold	26-35	Indian	India									
3	C00002	James Smith	jamessmith62@gmail.com	6369500232	Male	Bronze	26-35	American	United States									
4	C00003	Fatima Ahmed	fatimahmed32@gmail.com	9512645273	Female	Silver	26-35	Emirati	United Arab Emirates									
5	C00004	Hans Mueller	hansmueller6@gmail.com	9198796728	Male	Silver	50+	German	Germany									
6	C00005	Reyansh Mishra	reyanshmishra45@gmail.com	8583795498	Male	Gold	26-35	Indian	India									
7	C00006	Arjun Mishra	arjunmishra5@gmail.com	9418511229	Male	Bronze	18-25	Indian	India									
8	C00007	Svetlana Petrova	svetlanapetrova78@gmail.com	8272490710	Female	Silver	36-50	Russian	Russia									
9	C00008	Dmitri Ivanov	dmitriivanov41@gmail.com	7973974309	Male	Gold	50+	Russian	Russia									
10	C00009	Vihaan Sharma	vihaansharma70@gmail.com	6757368124	Male	Diamond	36-50	Indian	India									
11	C00010	Mohammed Ali	mohammedali87@gmail.com	6342782291	Male	Gold	50+	Emirati	United Arab Emirates									
12	C00011	Anika Gupta	anikagupta8@gmail.com	8630469676	Female	Diamond	18-25	Indian	India									
13	C00012	Wei Chen	weichen99@gmail.com	7155299498	Male	Diamond	26-35	Chinese	China									
14	C00013	Zara Mishra	zaramishra80@gmail.com	7386485472	Female	Gold	26-35	Indian	India									
15	C00014	Reyansh Mishra	reyanshmishra94@gmail.com	7569036132	Male	Diamond	50+	Indian	India									
16	C00015	Dev Verma	devverma60@gmail.com	7789842221	Male	Gold	50+	Indian	India									
17	C00016	Vihaan Jali	vihaanjali39@gmail.com	6166601944	Male	Silver	36-50	Indian	India									
18	C00017	Heidi Schneider	heidischneider51@gmail.com	6288665191	Female	Bronze	50+	German	Germany									
19	C00018	Aadhiya Yadav	aadhyayadav44@gmail.com	9459791187	Female	Diamond	36-50	Indian	India									
20	C00019	Linda Davis	lindadavis79@gmail.com	7615532809	Female	Gold	50+	Australian	Australia									
21	C00020	Myra Mehta	myramehta26@gmail.com	9167881811	Female	Silver	36-50	Indian	India									
22	C00021	Inaya Mishra	inayamishra95@gmail.com	8700321074	Female	Silver	18-25	Indian	India									
23	C00022	Ishaan Roy	ishaanroy94@gmail.com	7404390592	Male	Bronze	18-25	Indian	India									
24	C00023	Par Reddy	parreddy66@gmail.com	9713186842	Female	Bronze	36-50	Indian	India									
25	C00024	Mani Johnson	manijohnson69@gmail.com	8647900800	Female	Silver	50+	American	United States									
26	C00025	Fatima Ahmed	fatimahmed68@gmail.com	8510989320	Female	Bronze	36-50	Emirati	United Arab Emirates									
27	C00026	Michael Miller	michaelmiller66@gmail.com	9705213984	Male	Diamond	36-50	German	Germany									
28	C00027	Dmitri Ivanov	dmitriivanov52@gmail.com	6579744480	Male	Gold	26-35	Russian	Russia									
29	C00028	Dev Reddy	devreddy75@gmail.com	7468578521	Male	Diamond	18-25	Indian	India									
30	C00029	Aryan Kumar	aryankumar7@gmail.com	6114466564	Male	Bronze	36-50	Indian	India									
31	C00030	Ananya Sharma	ananyasharma47@gmail.com	7540394247	Female	Gold	36-50	Indian	India									
32	C00031	Elizabeth Martinez	elizabethmartinez13@gmail.com	7188597437	Female	Bronze	50+	Spanish	Spain									
33	C00032	Aarav Rath	aaravrath10@gmail.com	852082651	Male	Bronze	26-35	Indian	India									
34	C00033	Robert Jones	robertjones55@gmail.com	8605512508	Male	Gold	18-25	Canadian	Canada									
35	C00034	Yuki Suzuki	yukisuzuki51@gmail.com	8890401350	Female	Diamond	36-50	Japanese	Japan									
36	C00035	Zayn Patel	zaynpatel59@gmail.com	853317702	Male	Diamond	18-25	Indian	India									
37	C00036	Vihaan Khan	vihaankhan82@gmail.com	6975825935	Male	Silver	26-35	Indian	India									
38	C00037	Elizabeth Martinez	elizabethmartinez94@gmail.com	6635349959	Female	Silver	18-25	Spanish	Spain									
39	C00038	Michael Miller	michaelmiller97@gmail.com	9123255668	Male	Bronze	36-50	German	Germany									
40	C00039	Jennifer Garcia	jennifergarcia77@gmail.com	9273886042	Female	Diamond	36-50	Mexican	Mexico									
41	C00040	Aditya Sharma	adityasharma84@gmail.com	821098770	Male	Diamond	26-35	Indian	India									
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3	D00002	01-01-2020	1	January	2020	Wednesday	11-01-2020	11	January	2020	Saturday	10						
4	D00003	01-01-2020	1	January	2020	Wednesday	06-01-2020	6	January	2020	Monday	5						
5	D00004	01-01-2020	1	January	2020	Wednesday	13-01-2020	13	January	2020	Monday	12						
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8	D00007	01-01-2020	1	January	2020	Wednesday	14-01-2020	14	January	2020	Tuesday	13						
9	D00008	01-01-2020	1	January	2020	Wednesday	06-01-2020	6	January	2020	Monday	5						
10	D00009	01-01-2020	1	January	2020	Wednesday	02-01-2020	2	January	2020	Thursday	1						
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17	D00016	01-01-2020	1	January	2020	Wednesday	15-01-2020	15	January	2020	Wednesday	14						
18	D00017	01-01-2020	1	January	2020	Wednesday	08-01-2020	8	January	2020	Wednesday	7						
19	D00018	01-01-2020	1	January	2020	Wednesday	13-01-2020	13	January	2020	Monday	12						
20	D00019	02-01-2020	2	January	2020	Thursday	16-01-2020	16	January	2020	Thursday	14						
21	D00020	02-01-2020	2	January	2020	Thursday	10-01-2020	10	January	2020	Friday	8						
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23	D00022	02-01-2020	2	January	2020	Thursday	04-01-2020	4	January	2020	Saturday	2						
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A	B	C	D	E	F

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1	RoomTypeID	RoomType	PricePerDay	MaxOccupancy	Amenities	HasAC	IsSeaFacing								
2	RT01	Standard - Single Bed	1000	1	Wifi, TV	No	No								
3	RT02	Standard - Queen Bed	1500	2	Wifi, TV, Mini Bar	No	No								
4	RT03	Standard - King Bed	2000	3	Wifi, TV, Mini Bar	No	No								
5	RT04	Deluxe - Single Bed	2000	1	Wifi, TV, Mini Bar, Balcony	Yes	No								
6	RT05	Deluxe - Queen Bed	2500	2	Wifi, TV, Mini Bar, Balcony	Yes	No								
7	RT06	Deluxe - King Bed	3000	3	Wifi, TV, Mini Bar, Balcony	Yes	Yes								
8	RT07	Executive - Single Bed	3000	1	Wifi, TV, Mini Bar, Jacuzzi	Yes	Yes								
9	RT08	Executive - Queen Bed	3500	2	Wifi, TV, Mini Bar, Jacuzzi	Yes	Yes								
10	RT09	Executive - King Bed	4000	3	Wifi, TV, Mini Bar, Balcony, Jacuzzi	Yes	Yes								
11	RT10	Studio - King Bed	5000	3	Wifi, TV, Mini Bar, Balcony, Jacuzzi, Kitchenette	Yes	Yes								
12															
13															
14															
15															
16															
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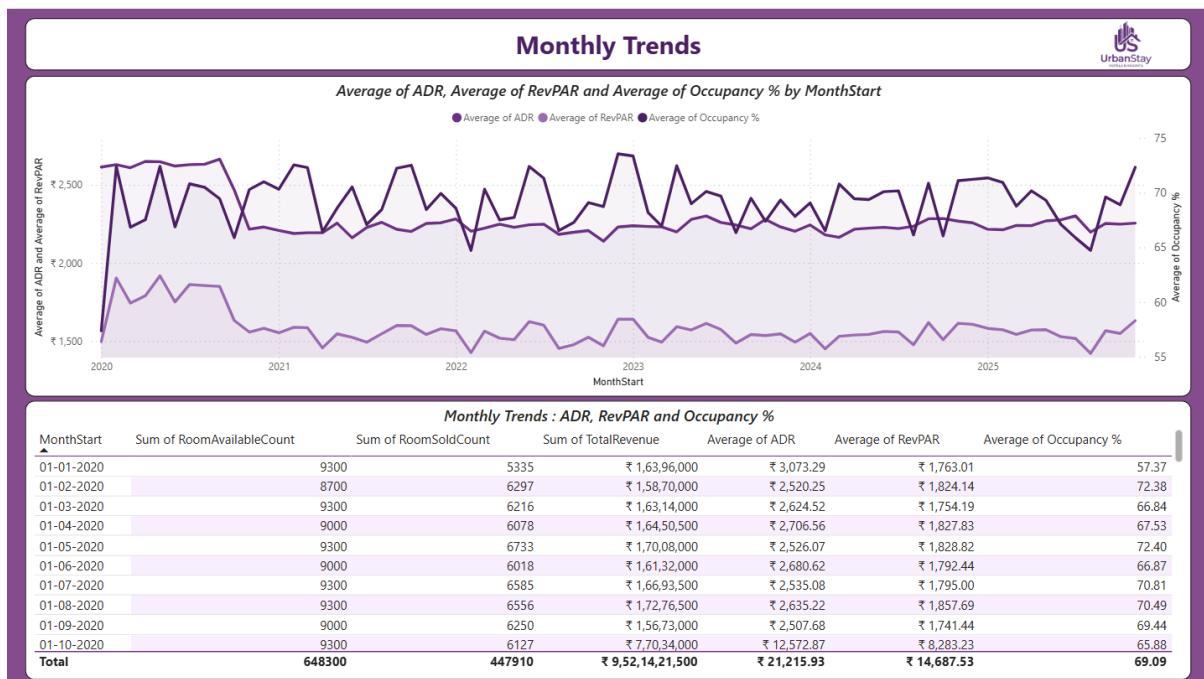
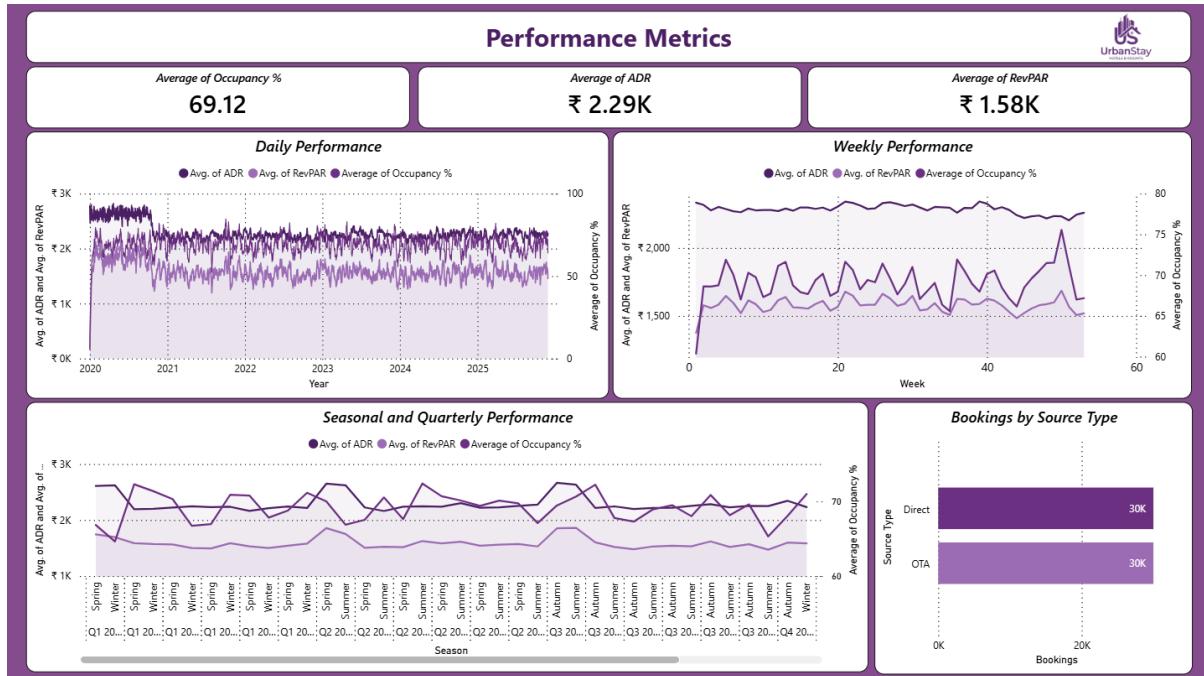
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3	BK00002	C00321	RT01	HB05	D00002	01-01-2020	11-01-2020	10	10000									
4	BK00003	C18474	RT03	HB03	D00003	01-01-2020	06-01-2020	5	10000									
5	BK00004	C16989	RT07	HB08	D00004	01-01-2020	13-01-2020	12	36000									
6	BK00005	C13214	RT03	HB01	D00005	01-01-2020	12-01-2020	11	22000									
7	BK00006	C00291	RT05	HB01	D00006	01-01-2020	08-01-2020	7	17500									
8	BK00007	C00524	RT07	HB04	D00007	01-01-2020	14-01-2020	13	39000									
9	BK00008	C04112	RT07	HB04	D00008	01-01-2020	06-01-2020	5	15000									
10	BK00009	C08959	RT07	HB06	D00009	01-01-2020	02-01-2020	1	3000									
11	BK00010	C19199	RT03	HB09	D00010	01-01-2020	12-01-2020	11	22000									
12	BK00011	C19554	RT02	HB04	D00011	01-01-2020	04-01-2020	3	4500									
13	BK00012	C16037	RT05	HB01	D00012	01-01-2020	07-01-2020	6	15000									
14	BK00013	C15528	RT03	HB05	D00013	01-01-2020	12-01-2020	11	22000									
15	BK00014	C17232	RT03	HB01	D00014	01-01-2020	13-01-2020	12	24000									
16	BK00015	C00502	RT09	HB02	D00015	01-01-2020	05-01-2020	4	16000									
17	BK00016	C00319	RT08	HB02	D00016	01-01-2020	15-01-2020	14	40000									
18	BK00017	C06965	RT01	HB01	D00017	01-01-2020	08-01-2020	7	7000									
19	BK00018	C02543	RT06	HB05	D00018	01-01-2020	13-01-2020	12	36000									
20	BK00019	C16918	RT01	HB02	D00019	01-01-2020	16-01-2020	14	14000									
21	BK00020	C15670	RT02	HB04	D00020	02-01-2020	10-01-2020	8	12000									
22	BK00021	C03344	RT09	HB01	D00021	01-01-2020	10-01-2020	8	32000									
23	BK00022	C03980	RT04	HB05	D00022	02-01-2020	04-01-2020	2	4000									
24	BK00023	C08975	RT02	HB03	D00023	02-01-2020	03-01-2020	1	1500									
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26	BK00025	C05045	RT06	HB01	D00025	02-01-2020	14-01-2020	12	36000									
27	BK00026	C10282	RT01	HB01	D00026	02-01-2020	12-01-2020	10	10000									
28	BK00027	C00543	RT07	HB08	D00027	02-01-2020	09-01-2020	7	21000									
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32	BK00031	C12525	RT07	HB01	D00031	02-01-2020	04-01-2020	2	6000									
33	BK00032	C02152	RT05	HB02	D00032	02-01-2020	09-01-2020	7	17500									
34	BK00033	C02042	RT01	HB05	D00033	02-01-2020	08-01-2020	6	6000									
35	BK00034	C17566	RT02	HB05	D00034	02-01-2020	11-01-2020	9	13500									
36	BK00035	C09817	RT04	HB02	D00035	02-01-2020	10-01-2020	8	16000									
37	BK00036	C12169	RT02	HB03	D00036	02-01-2020	03-01-2020	1	1500									
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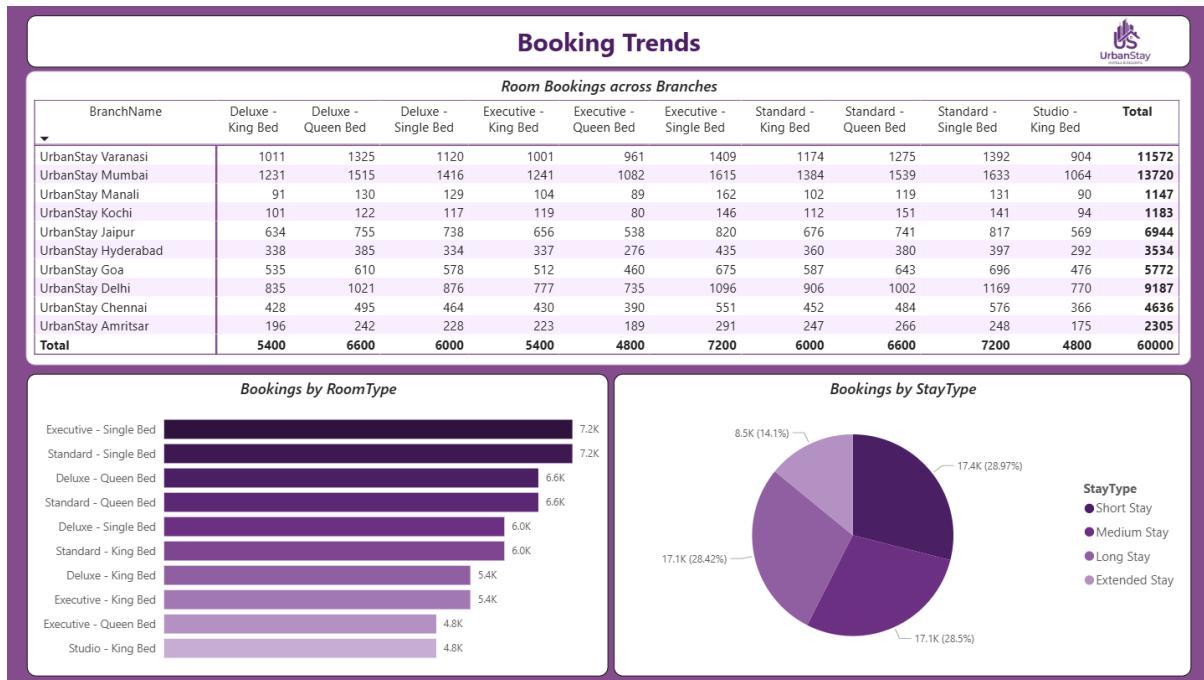
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1	Row Labels	Sum of Room Booked																
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5	Jan	5335																
6	Feb	6297																
7	Mar	6216																
8	Apr	6078																
9	May	6733																

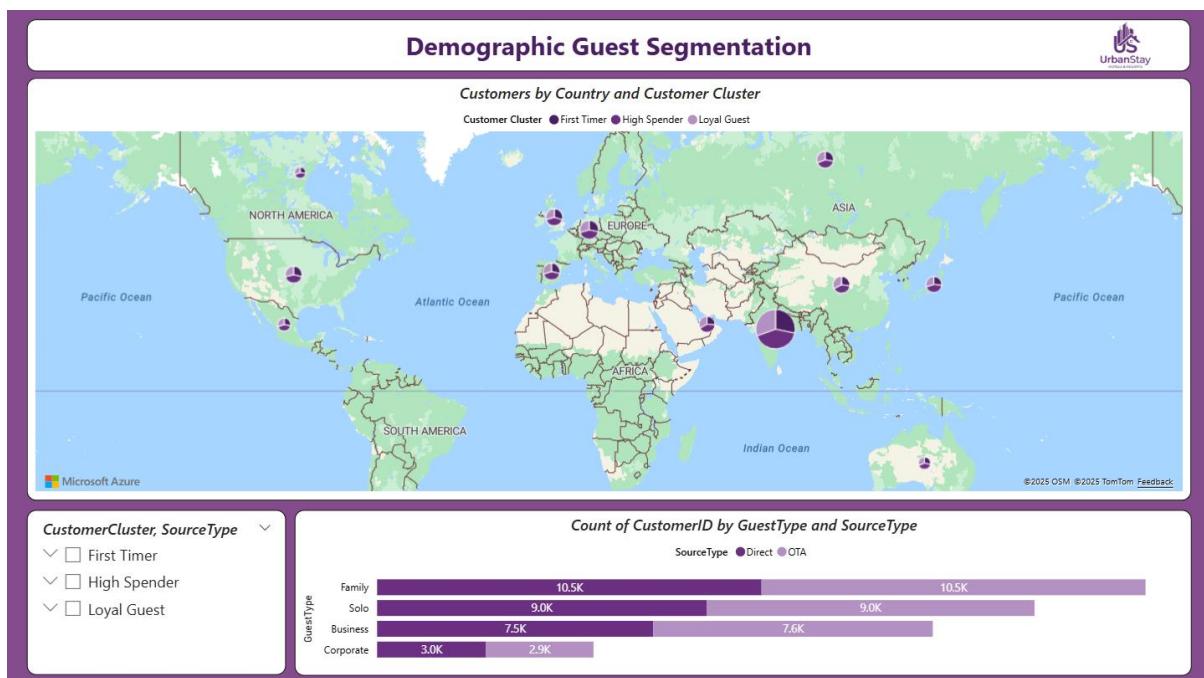
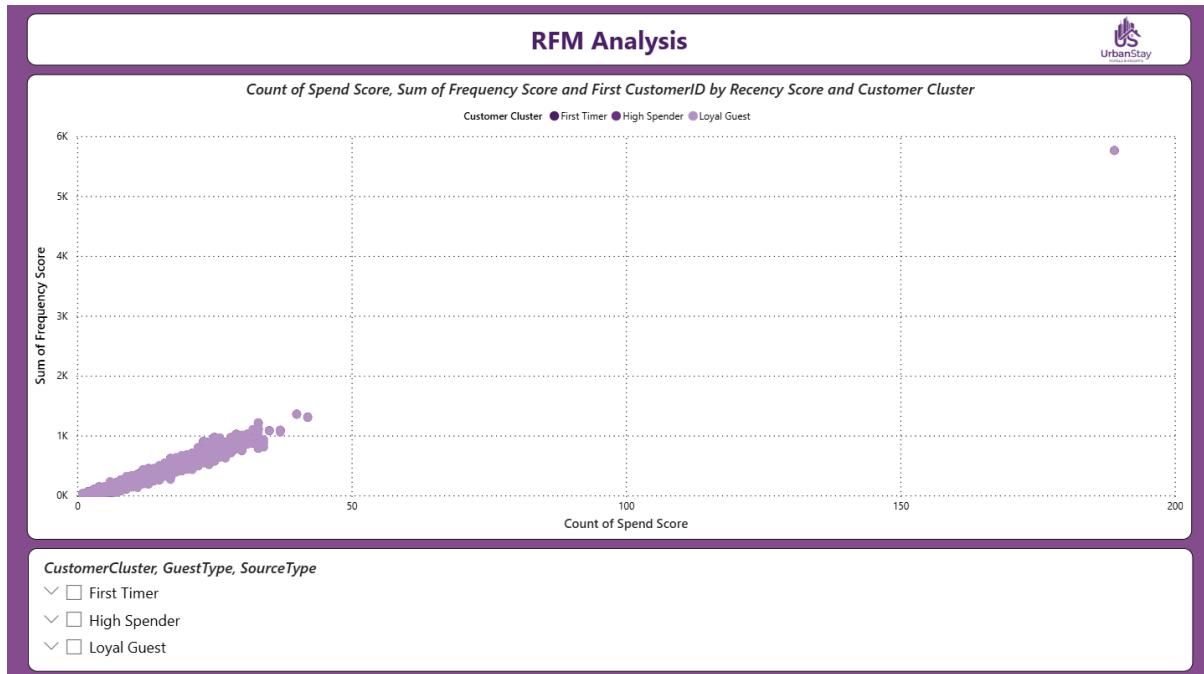
Star Schema:

Module-2 - Occupancy & Revenue Metrics

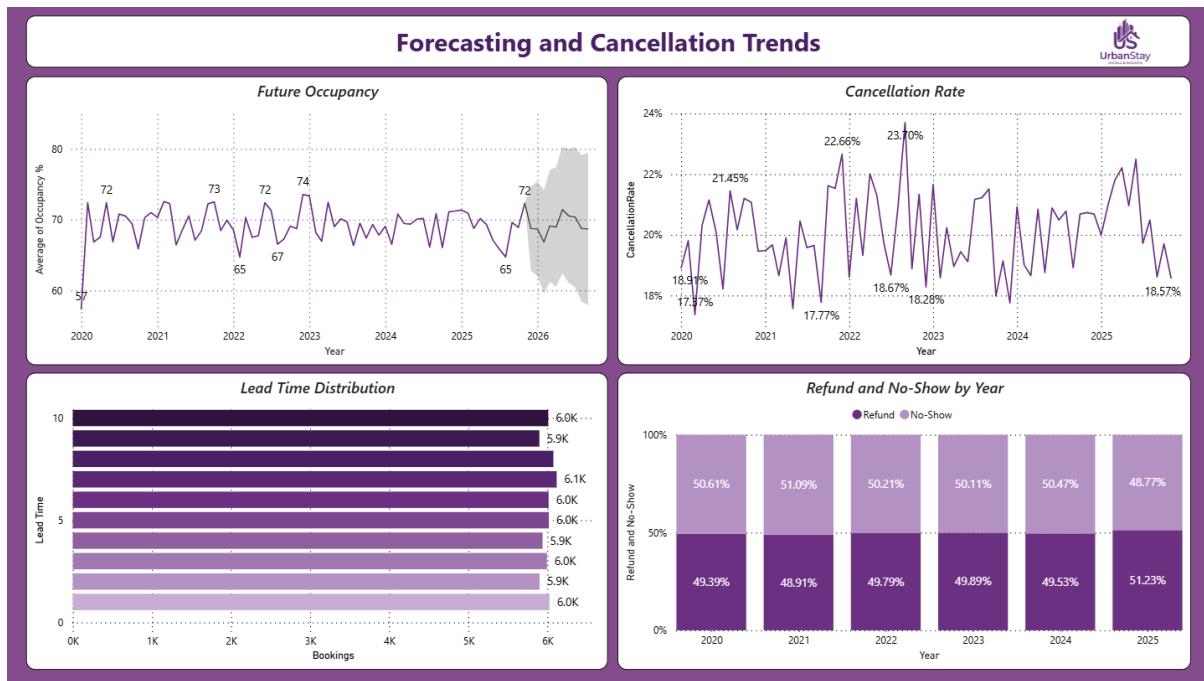


Module-3 - Guest Analysis Module

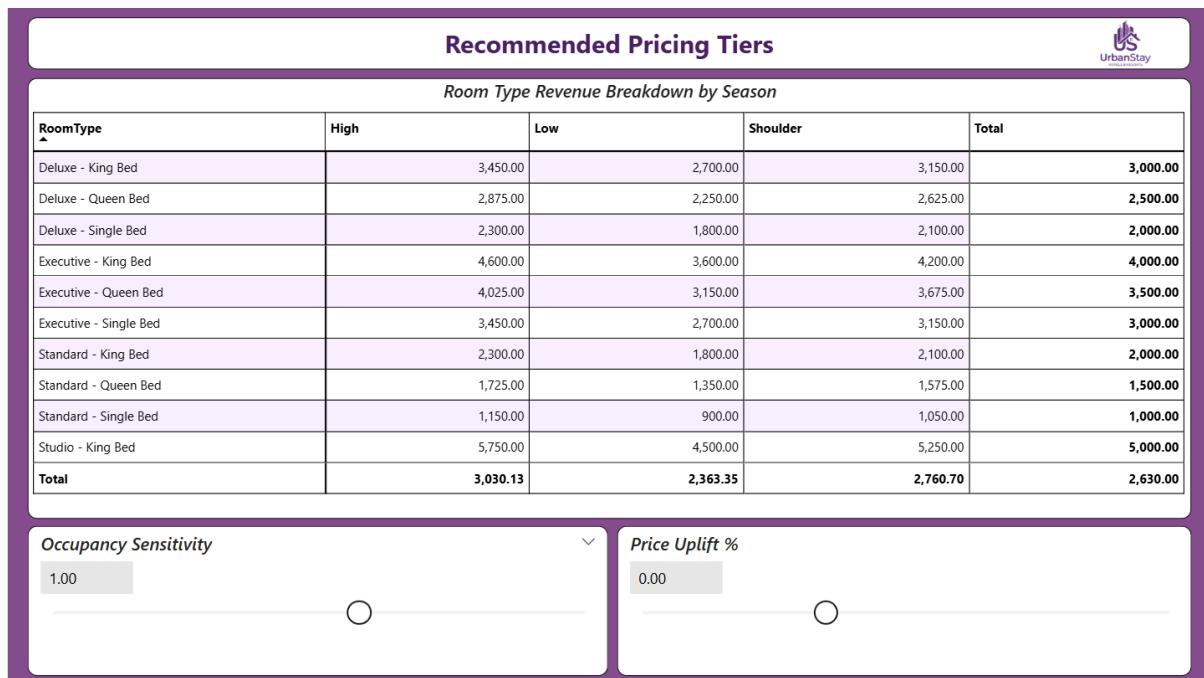
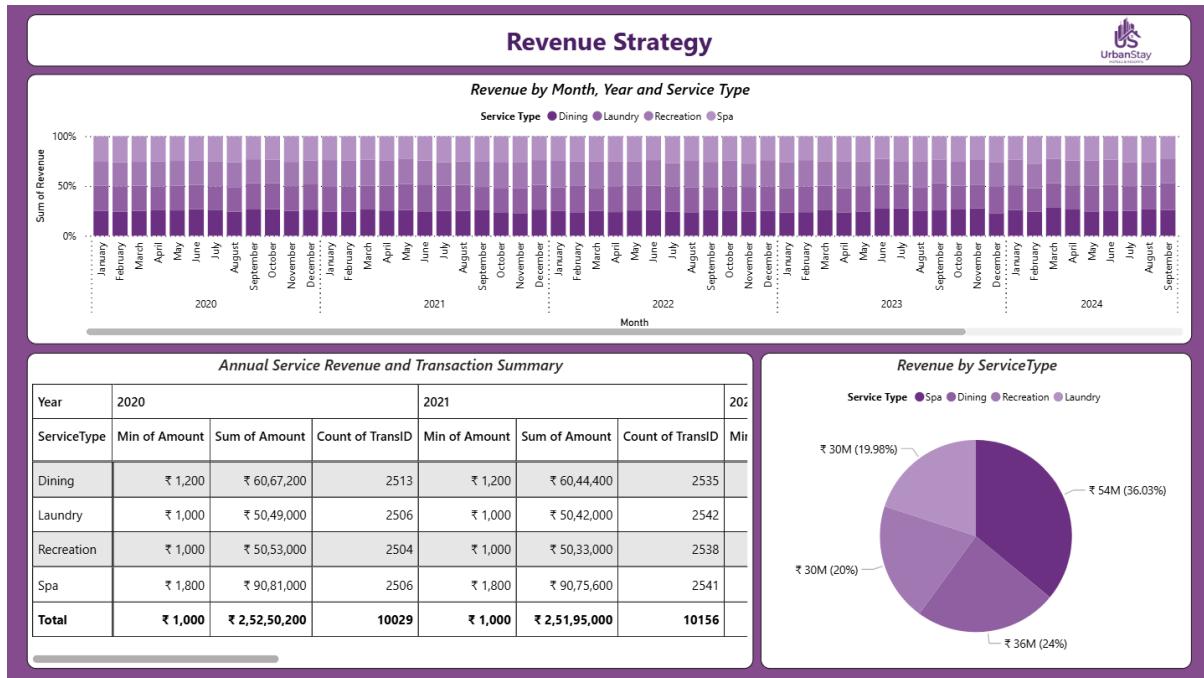




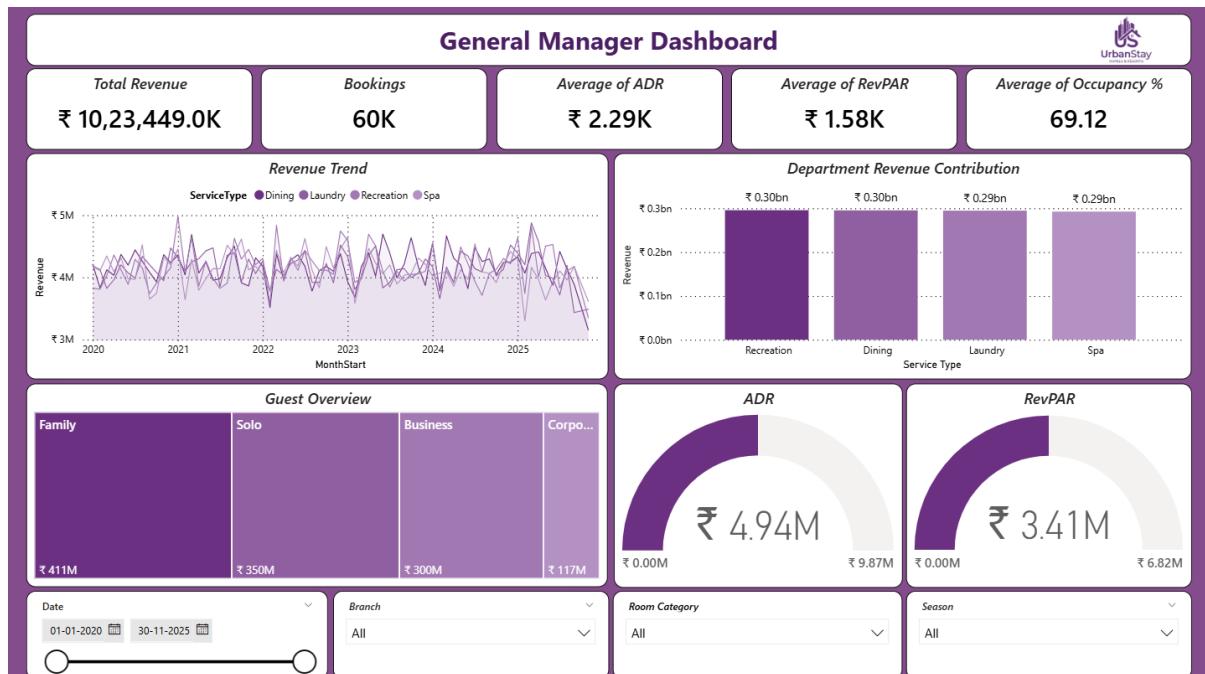
Module-4 - Forecasting and Cancellation Trends



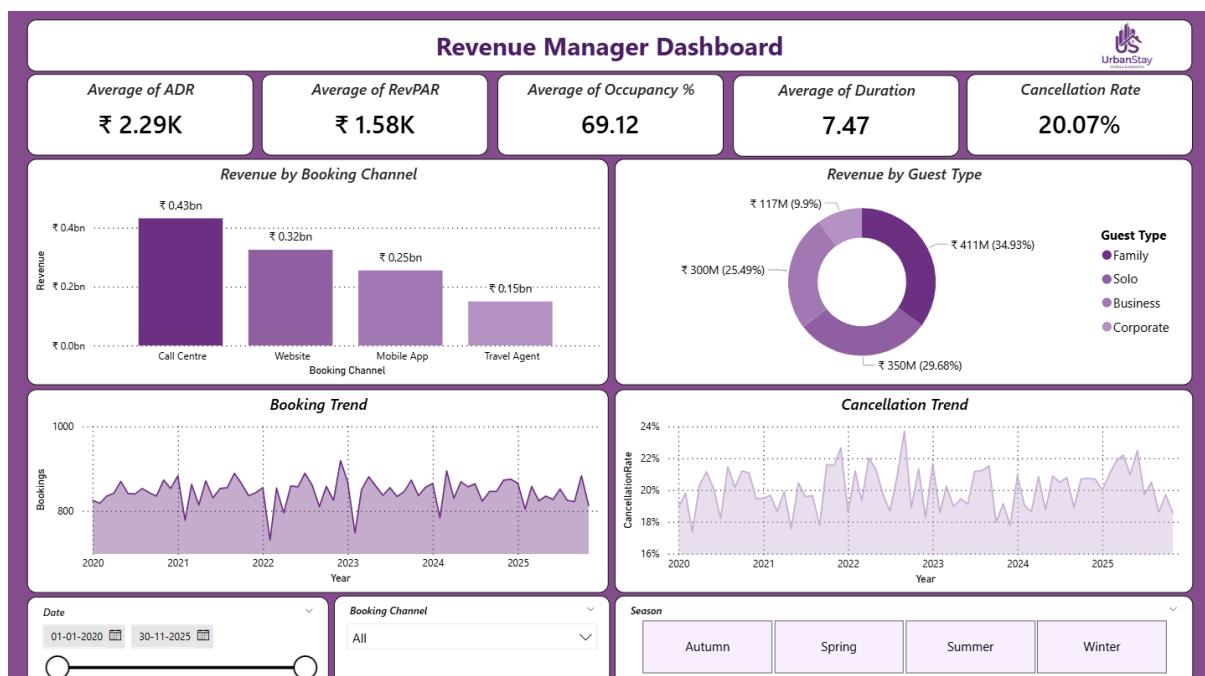
Module 5 - Revenue Strategy Dashboard



General Manager Dashboard



Revenue Manager Dashboard



VII. Challenges Faced:

During the development and implementation of the **HotelRevAI – AI-Driven Revenue Analysis for Hotels** project, several technical, analytical, and design-related challenges were encountered. These challenges were systematically addressed to ensure the successful completion of the project.

- **Data Quality and Consistency Issues:**

Hotel booking datasets contained missing values, inconsistent date formats, and varied representations of booking channels and room categories. Significant effort was required to clean, standardize, and validate the data before analysis.

- **Complexity in Data Modelling:**

Designing a scalable **star schema** that accurately represented booking facts while supporting multiple dimensions such as date, room type, customer, and hotel branch required careful planning to avoid redundancy and ensure efficient querying.

- **Accurate KPI Calculation:**

Metrics like Occupancy %, ADR, and RevPAR require precise business logic. Ensuring correct calculations across different time granularities (daily, weekly, seasonal) while avoiding aggregation errors was a major analytical challenge.

- **Guest Segmentation and Classification:**

Segmenting guests into categories such as business, family, loyal guests, and high spenders involved selecting meaningful features and validating segmentation logic to ensure business relevance.

- **Forecasting and Trend Interpretation:**

Predicting future occupancy and interpreting cancellation trends required careful handling of historical data patterns and seasonality to avoid misleading forecasts.

- **Dashboard Design and Usability:**

Creating a single dashboard that balances detailed analytics with clarity for both **General Managers** and **Revenue Managers** was challenging. The dashboard needed to remain interactive, intuitive, and decision-focused without overwhelming users.

VIII. Learnings & Skills Acquired:

The **HotelRevAI** project provided extensive hands-on exposure to hospitality analytics, data modeling, and business intelligence tools. The key learnings and skills acquired during the project include:

- **Hospitality Domain Knowledge:**

Gained a strong understanding of hotel revenue management concepts such as occupancy rate, ADR, RevPAR, booking lead time, and cancellation behavior.

- **Data Modeling & ETL Skills:**

Learned to design and implement a star schema, handle fact–dimension relationships, and create calculated fields for analytical reporting.

- **Data Analysis & KPI Development:**

Developed expertise in calculating and validating business KPIs and analyzing trends across time, customer segments, and booking channels.

- **Guest Segmentation & Behavioral Analysis:**

Acquired skills in customer profiling, segmentation, and clustering to identify loyal guests, high-value customers, and different traveler types.

- **Forecasting & Trend Analysis:**

Learned to analyze historical booking data to identify demand patterns, seasonal trends, and future occupancy forecasts.

- **Dashboard Development & Storytelling:**

Improved proficiency in building interactive dashboards using Power BI, applying slicers, drill-downs, and visual storytelling techniques to present insights effectively.

- **Analytical Thinking & Decision Support:**

Strengthened the ability to translate raw data into actionable insights that support strategic decision-making for hotel management.

IX: Conclusion

The **HotelRevAI** – AI-Driven Revenue Analysis for Hotels project successfully demonstrates the application of data analytics and AI concepts in the hospitality domain. By integrating data modeling, performance metrics, guest analysis, and forecasting into a unified dashboard, the project delivers actionable insights that support strategic revenue management.

The project enhanced practical understanding of hotel KPIs, data visualization, analytical thinking, and business-oriented storytelling. Overall, **HotelRevAI** serves as a strong foundation for advanced analytics- driven decision support systems in the hospitality industry.

X: Acknowledgements

I sincerely thank the mentors, coordinators, and reviewers for their valuable guidance and continuous support throughout the project. Their feedback and direction played a crucial role in the successful completion of this project. I am also grateful for the opportunity to apply analytical and AI concepts to a real-world hospitality use case.