



PROJECT TITLE

Optimizing Revenue Leakage & Profitability in the Hospitality Sector

(Consulting and Analytics club, IIT Guwahati, Summer Project'2025)

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visit my [linkedin](#) & also get this project on [github](#) . Also get colab [notebook](#)



INTRODUCTION



The hospitality industry, while lucrative, often suffers from revenue inefficiencies due to high operational complexity, dynamic customer behavior, and fluctuating booking patterns.



In this project, we have conducted a deep-dive analytics exercise to uncover hidden revenue leakages and optimize profitability across key properties. Through structured KPI-backed analysis, trend mapping, and root cause exploration, this study delivers actionable recommendations for price restructuring, operational improvement, and policy interventions — all visualized through an interactive Power BI dashboard.

GOALS AND OBJECTIVES

01

Find out the main reasons behind revenue losses in hotels by checking booking patterns, cancellations and room usage.

02

Study important trends like how many bookings are done, how much revenue is earned, when cancellations happen, and how customers rate their stay.

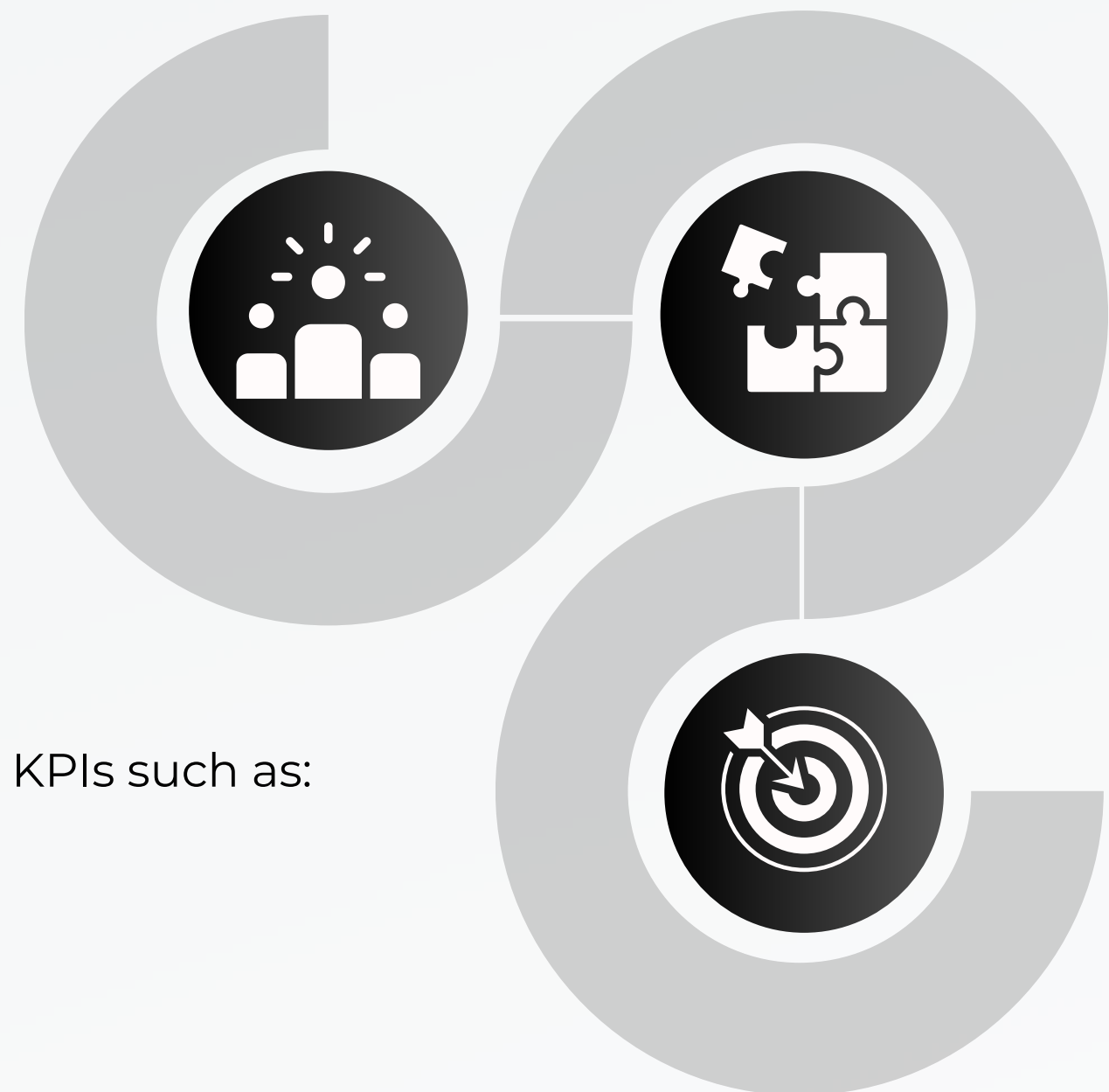
03

Give smart and practical consulting recommendation (like pricing, policy changes, platform strategies) based on data, not just assumptions.

04

Build a clear and interactive dashboard using important KPIs such as:

- ADR (Average Daily Rate)
- RevPAR (Revenue per Available Room)
- Occupancy %
- Revenue Leakage



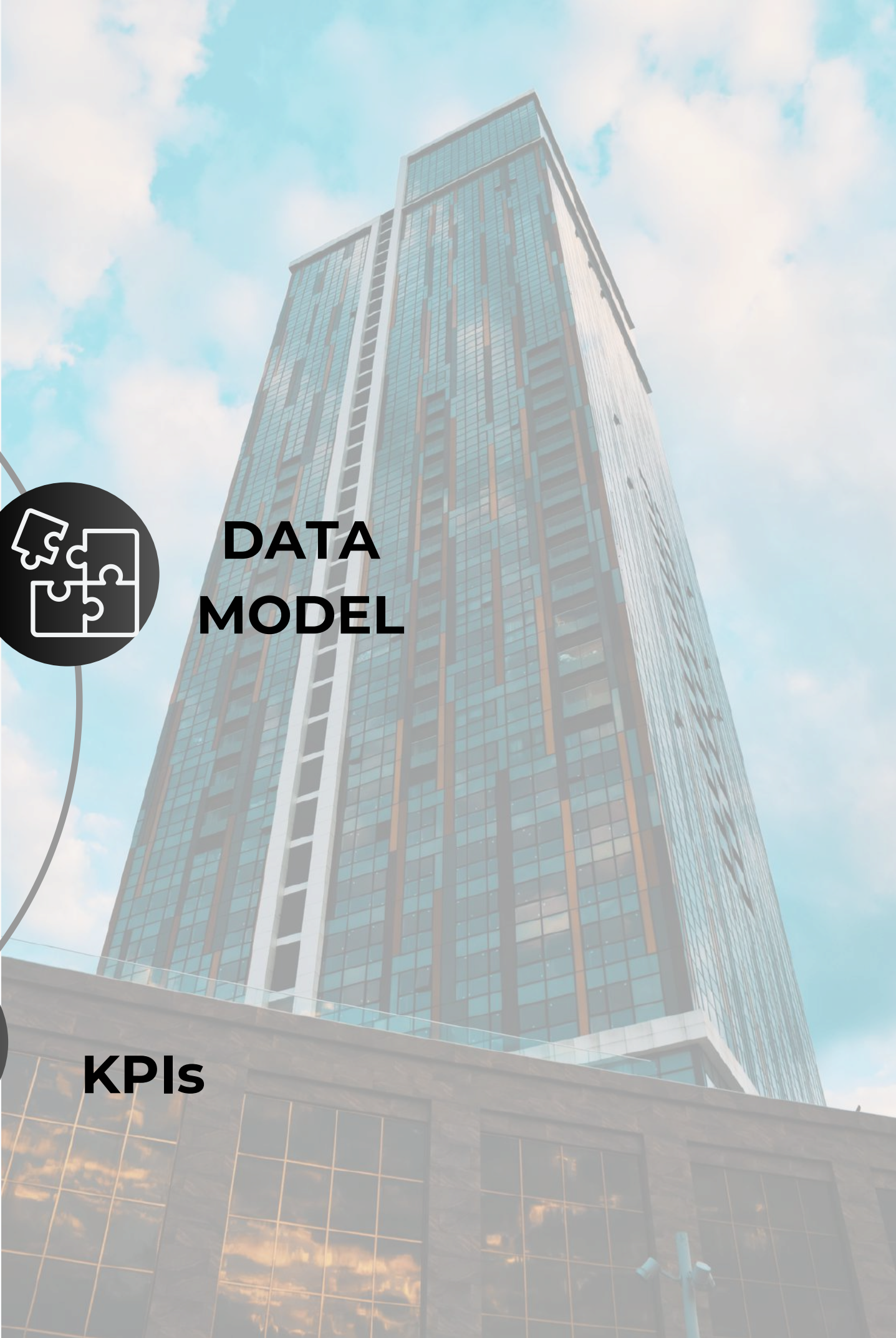
**COMPANY
OVERVIEW**

**PLOTS AND
INSIGHTS**

**DATA
MODEL**

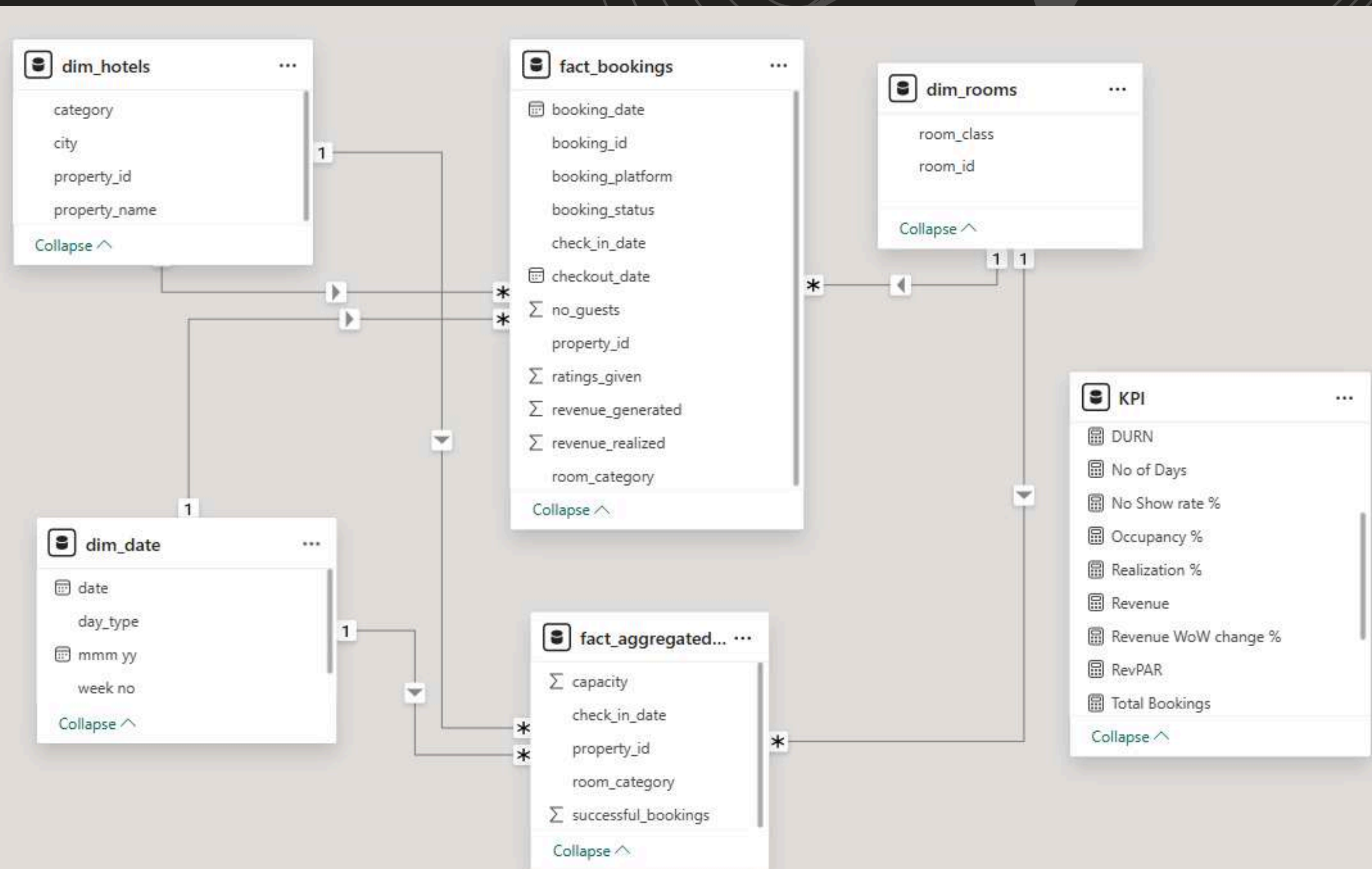
DASHBOARD

KPIs



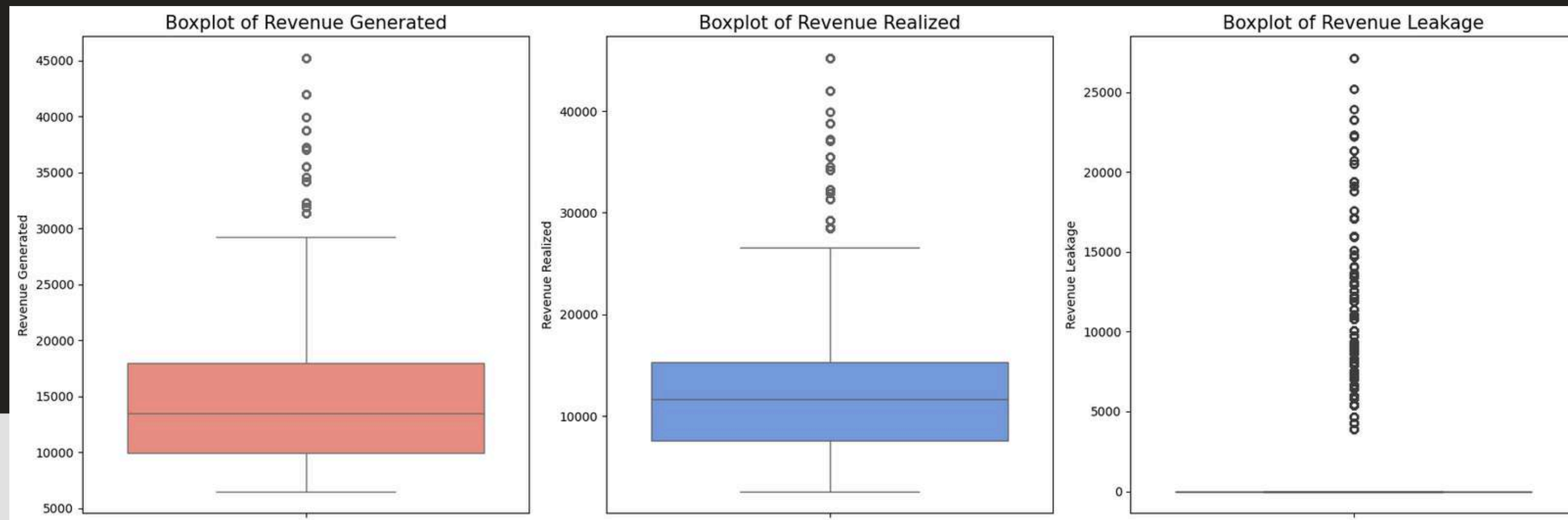
DATA MODEL

star schema



Interactive dashboard Link





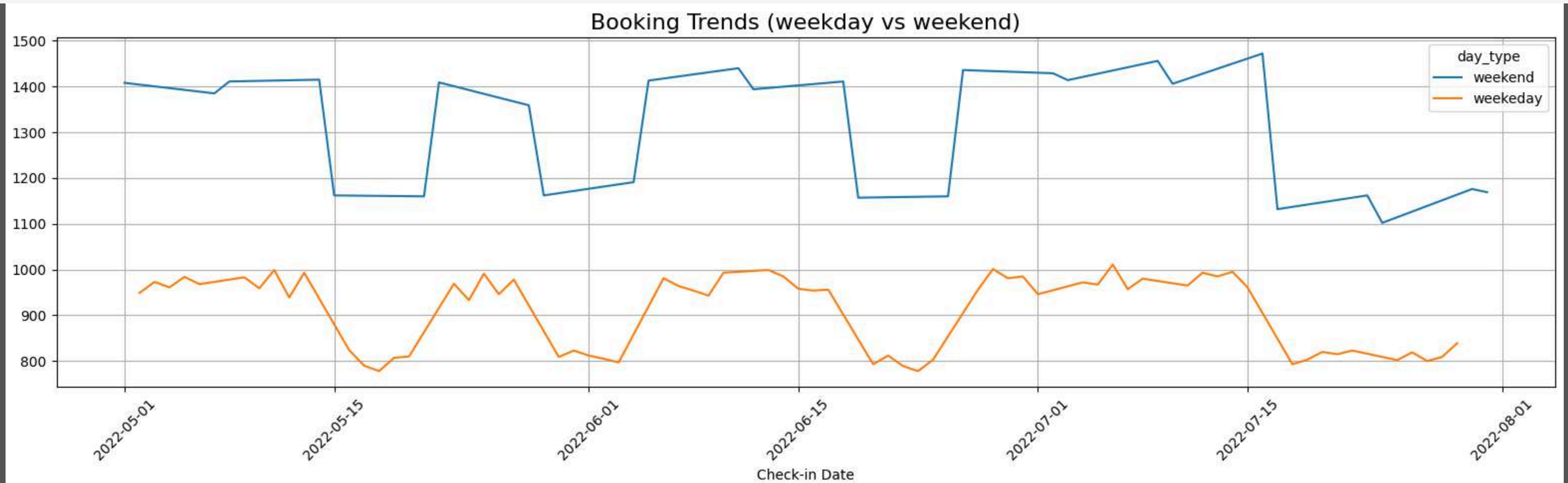
Revenue Distribution – Generated, Realized & Leakage

Insights:

- Revenue Generated and Revenue Realized have a similar range, but Realized is slightly lower overall.
- There are many outliers (dots above the box), meaning some bookings are extremely high in value.
- The Revenue Leakage boxplot is highly skewed:
 - Most leakage values are near zero
 - But a few bookings show very high leakage, going above ₹25,000 — these are unusual and risky.

Recommendation:

- Investigate the outlier cases with high leakage — they may be linked to high-value bookings getting cancelled or refunded.
- Hotels should consider applying stricter cancellation policies or non-refundable clauses for premium room categories.
- Also, track such leakage regularly using a visual like this to spot unusual spikes early.



Booking Trends Over Time – Weekday vs. Weekend



Insights

- Weekend bookings are consistently higher than weekday bookings across most of the timeline.
- There are some drops in both weekday and weekend bookings regularly, possibly in mid months.
- The pattern suggests that guests prefer weekend stays, likely for leisure travel.
- Business opportunities: weekends are stronger performers, so weekday upsell strategies may help balance the load.
- Hotels can try special offers for weekdays to attract more guests.



Weekly Avg Rating vs Occupancy %

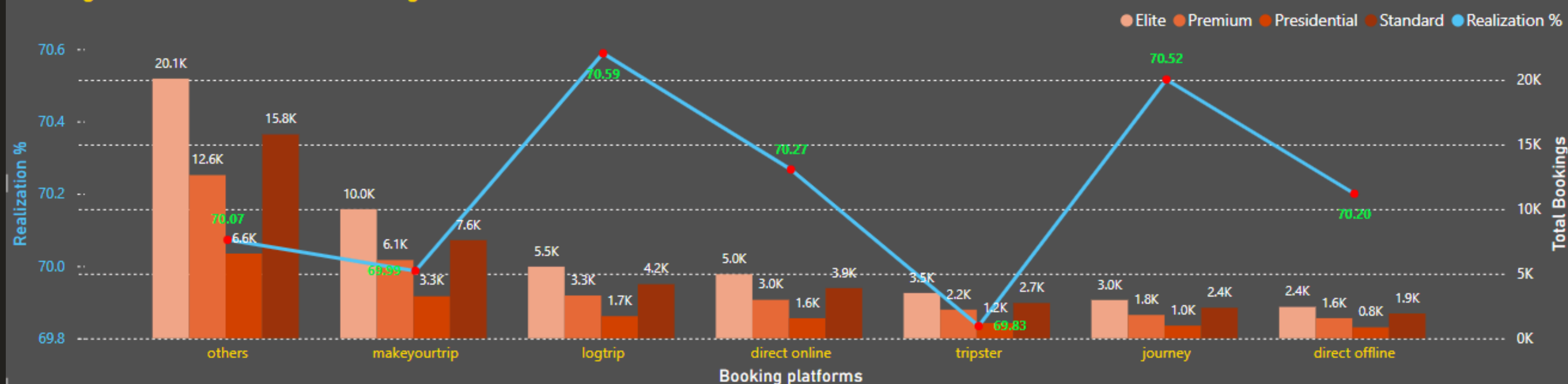
Insights

- Occupancy % changes a lot from week to week, ranging from 51% to 65.3%.
- However, Average Rating stays mostly stable between 3.59 and 3.65, even when occupancy drops.
- The **highest occupancy** was in **Week 32 (65.3%)**, while the lowest ratings were in the last few weeks (around 3.59).
- Weeks like W21 and W30 had very low occupancy but ratings did not fall much, showing service consistency.

Recommendation:

- Since customer satisfaction is steady, even during low occupancy weeks, these weeks can be used for discounts or campaigns without fear of quality drop.

Booking Platform vs Rooms vs booking count



Booking Platform vs Room Types vs Realisation %

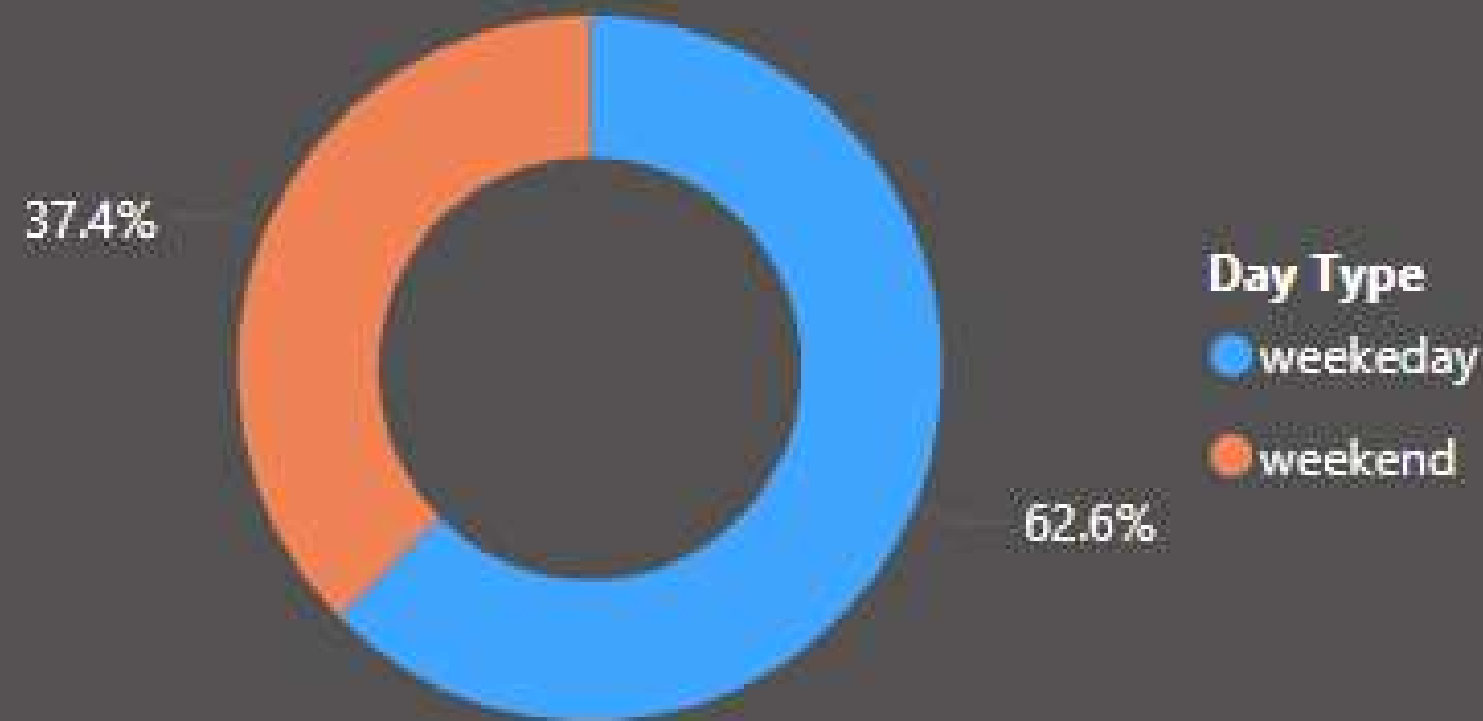
Insights

- "Others" platform gets the most bookings (20.1K), followed by Makeyourtrip (15.8K) and Logtrip (10K).
- Elite and Premium rooms are the most booked across all platforms.
- Direct platforms (online/offline) receive much lower booking volume compared to third-party platforms.
- Realisation % (blue line) remains fairly stable across platforms, between 69.83% and 70.59%, with the highest being Logtrip.

Recommendation:

- Improve direct booking platform visibility through loyalty points, better UX, or exclusive discounts.
- Monitor high-booking platforms like "others" for data transparency and cancellation behavior, as they dominate volume but offer less control.

Revenue by day_type



Weekday vs Weekend Performance

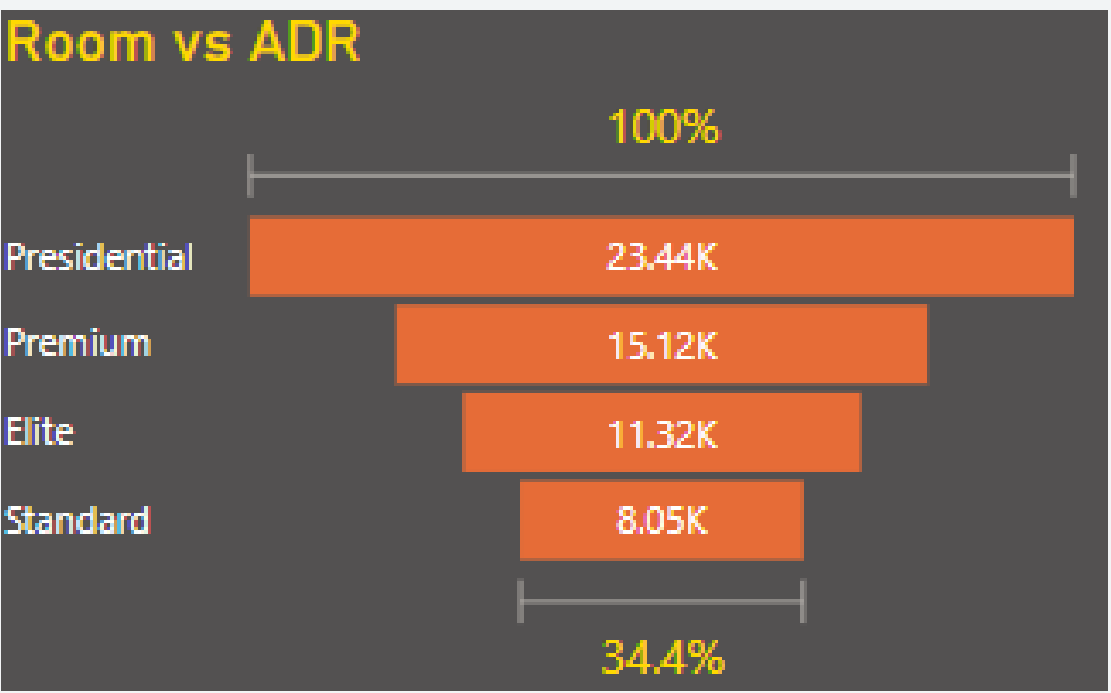
Insights

- 62.6% of total revenue comes from weekdays, while weekends contribute 37.4%.
- However, weekends perform much better on efficiency metrics:
- Occupancy %: 73.58% (weekend) vs 51.34% (weekday)
- RevPAR: ₹9.36K (weekend) vs ₹6.51K (weekday)
- Realisation % is slightly better on weekends too (70.46% vs 69.96%)
- ADR (Average Daily Rate) remains nearly the same across both (₹12.7K).

Recommendation:

- Weekends bring higher returns per room despite lower total revenue — they are more efficient.
- Consider launching weekday combo packages or discounts to boost occupancy.
- Since room prices (ADR) are stable, small occupancy gains during weekdays could greatly improve overall profitability.

day_type	RevPAR	Revenue	ADR	Occupancy %	Realization %
weekday	6.51K	1069.7M	12.68K	51.34	69.96
weekend	9.36K	639.1M	12.72K	73.58	70.46



Weekly ADR vs RevPAR + Room Type Pricing

Insights (Line Chart – Weekly Trend):

- ADR (Average Daily Rate) is fairly stable across weeks, staying between ₹12,600–₹12,750.
- RevPAR (Revenue per Available Room) fluctuates much more — from ₹6.5K to ₹8.3K, depending on occupancy.
- Highest RevPAR was in Week 32, lowest in W21/W30.
- Drop in RevPAR even when ADR is constant suggests occupancy is the key driver.

Insights (Funnel Chart – Room ADR):

- Presidential rooms have the highest ADR at ₹23.44K, almost 3x more than standard rooms.
- Standard rooms average only ₹8.05K, with a noticeable pricing gap at each level.
- This pricing tier shows clear segmentation — but bookings must match this value.

Recommendation:

- Since ADR is stable but RevPAR changes, focus on boosting occupancy in low-performing weeks to increase revenue.
- Promote higher-value rooms like Presidential during off-peak weeks using targeted packages (spa, meals, early check-in).
- Maintain this room pricing ladder, but ensure Presidential rooms justify their price with top-tier service & exclusivity.

Late Booking Policy – Revenue Leakage Optimization

this is an scenario simulation of operational changes

We assumed a new policy:

→ If late bookings are cancelled, the hotel will not refund (i.e., full penalty applied).



We defined "Late Bookings" as:
Booking gap \leq 2 days (i.e., check-in is within 2 days of booking date)



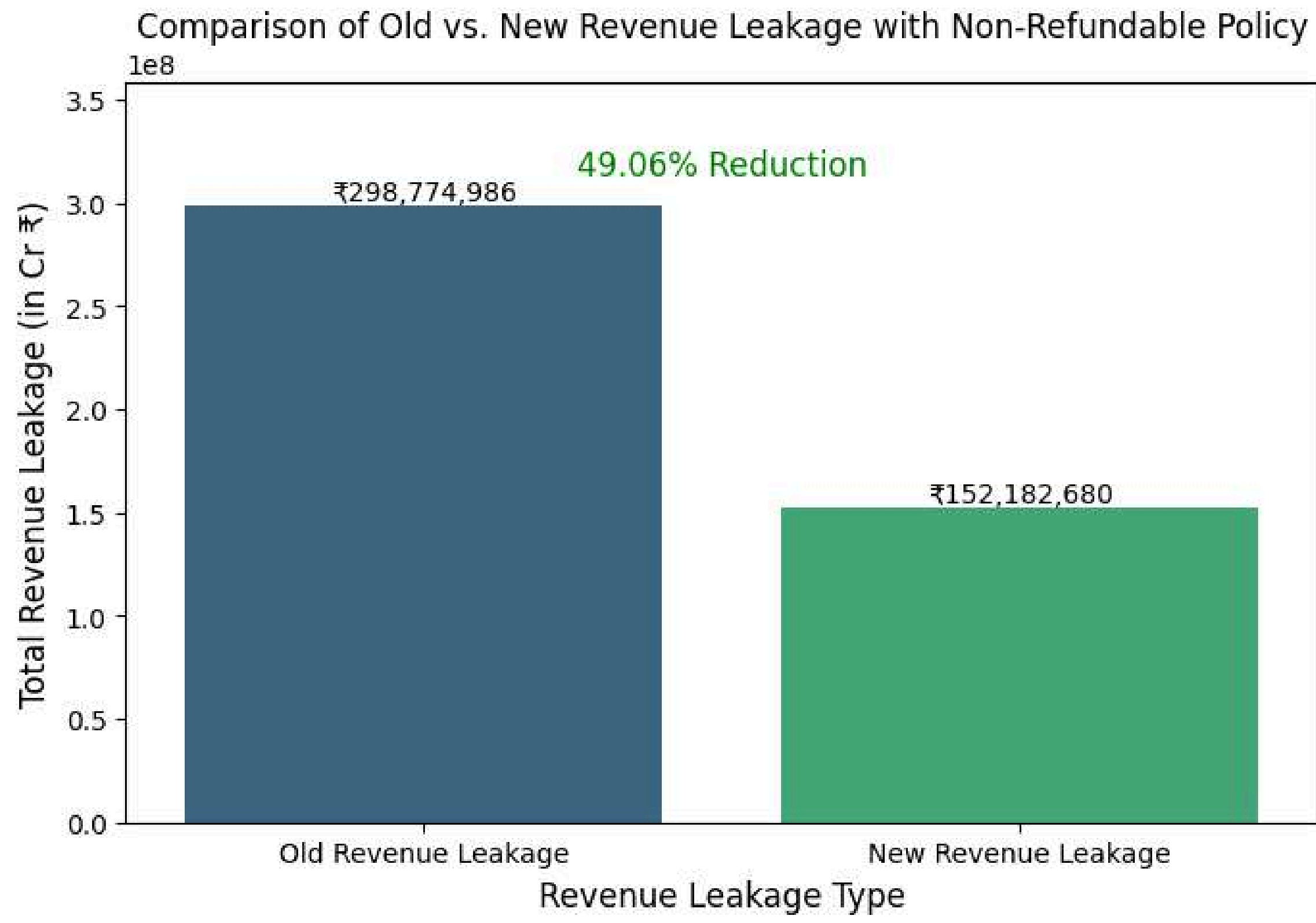
In this simulation, we set revenue leakage = 0 for those late cancellations (since payment is not refunded).

Revenue leakage reduced by ~49% after applying this rule.

This shows that a simple non-refundable rule for late bookings can save a big chunk of lost revenue.



Result of Revenue Leakage Reduction by Applying Non-Refundable Policy



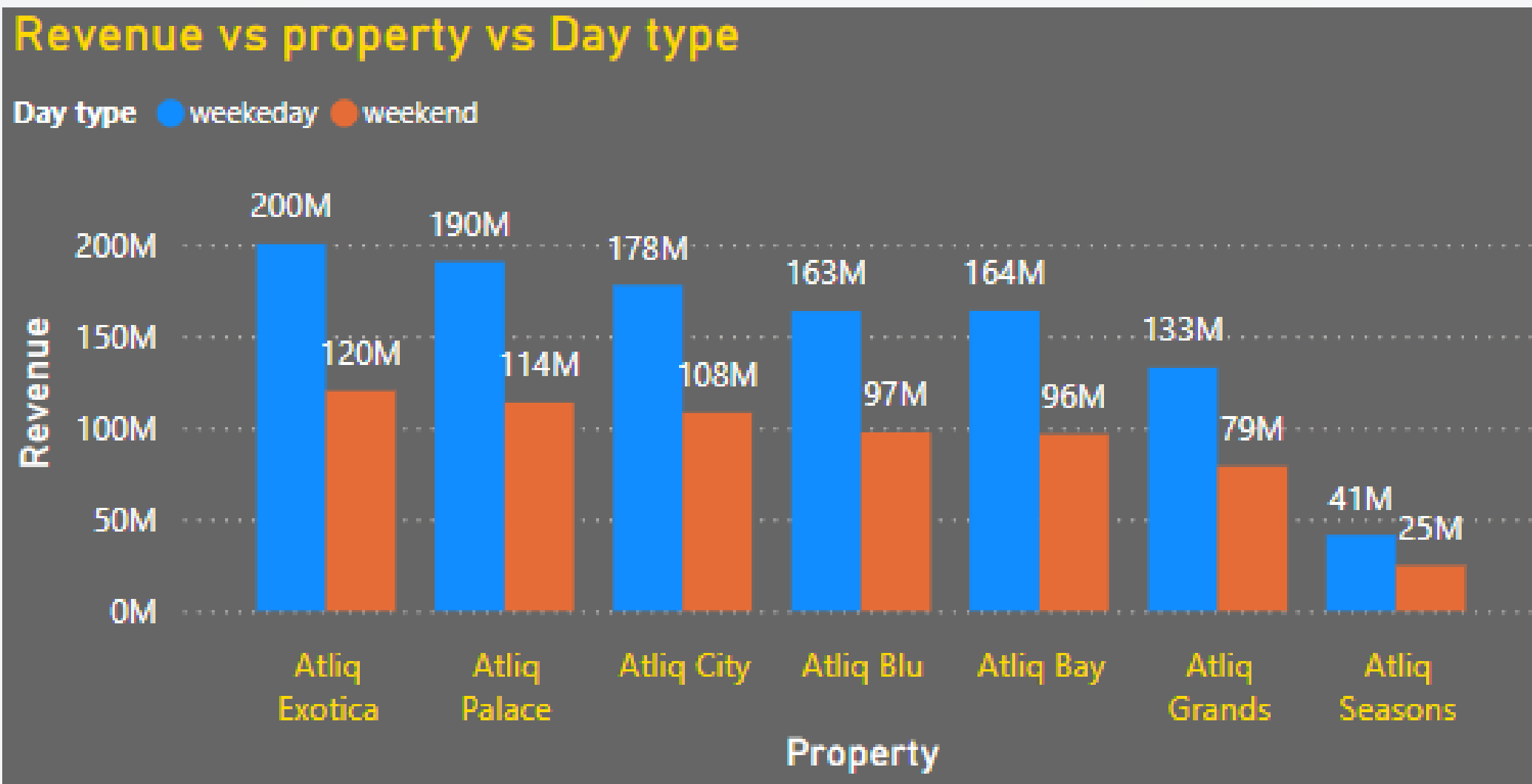
Insights

- Late cancellations were one of the biggest reasons for revenue loss.
 - Although early cancellations are also many (~50%) in number but applying this policy on late cancellation is justified.
 - By not allowing refund for these late cancellations, hotels can protect their revenue.
- This policy is easy to apply and can save ₹14.6 Cr+ (~49%) in just one season !

Recommendation:

- Hotels should introduce a non-refundable policy for last-minute cancellation (e.g., bookings made \leq 2 days before check-in).
- Policy must be clearly communicated on all platforms.
- Can also add flexible (refundable) options for early bookings to balance fairness and customer trust.

Revenue Comparison by Property & Day Type



Insights

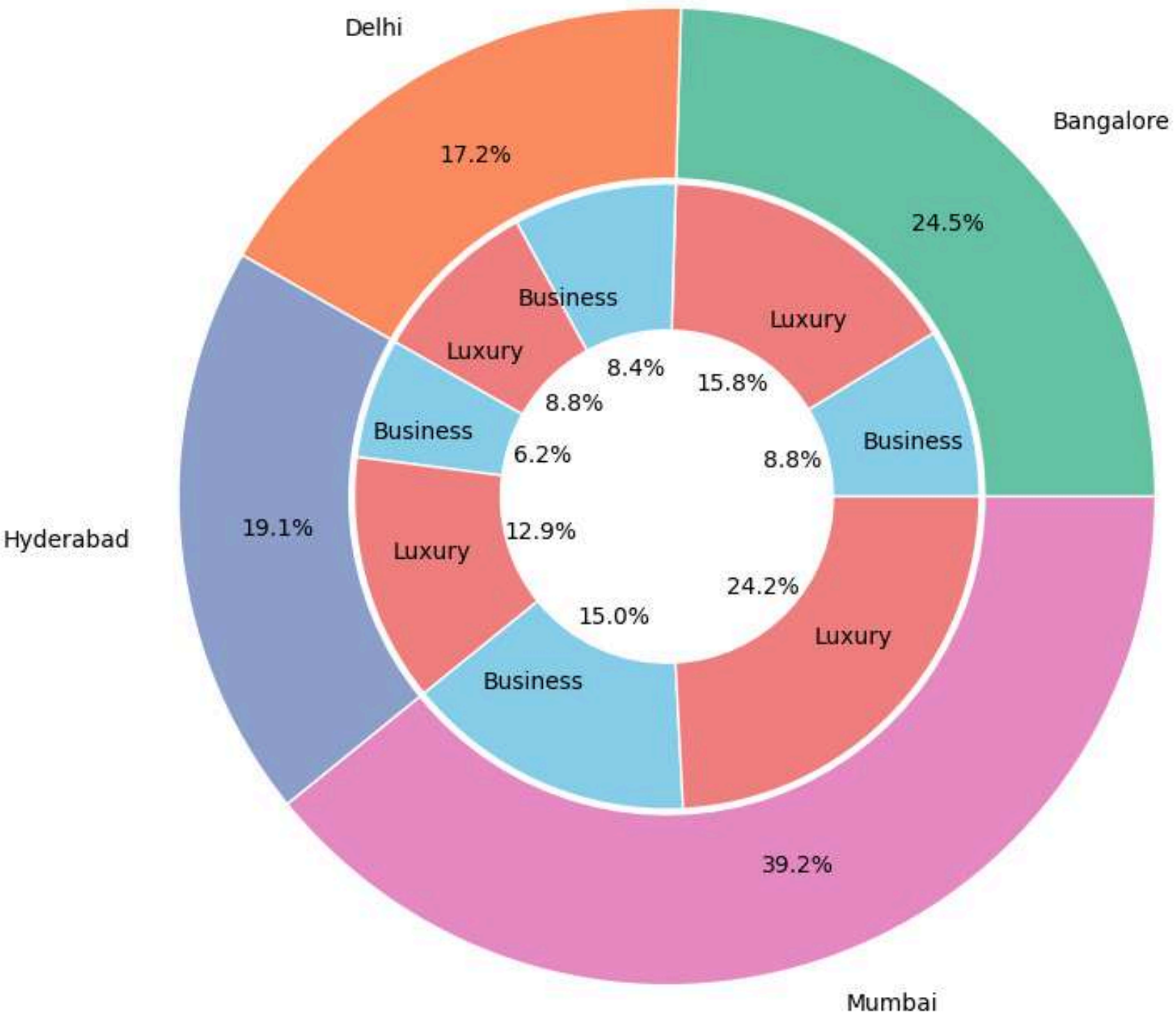
- Atliq Exotica is the top performer, with ₹200M weekday and ₹120M weekend revenue.
- Atliq Palace and Atliq City also contribute heavily, each crossing ₹170M+ on weekdays.
- Across all properties, weekday revenue is higher than weekend revenue, likely due to longer business stays.
- Atliq Seasons and Atliq Grands are the lowest contributors in both segments.
- Revenue gaps between weekdays and weekends are significant for each property, showing differing usage patterns.

Recommendations:

- Underperforming properties like Atliq Seasons and Grands need a detailed audit — check service quality, pricing, or location issues.
- High-revenue properties (Exotica, Palace, City) can test premium upsell offers on weekends to bridge the weekend gap.

Revenue Comparison by Property & Day Type

City-wise Revenue Split by Category



Insights

- Mumbai earned the highest total revenue (39.2%) among all cities.
- Bangalore comes second with 24.5%, followed by Hyderabad (19.1%) and Delhi (17.2%).
- In every city, Luxury hotels earned more than Business hotels.
- Mumbai's Luxury segment alone brings the highest single-category share (24.2%) across all cities.
- Delhi has a more balanced split between Business and Luxury, but still, Luxury is leading.

Recommendation:

- Focus more on Luxury offerings, especially in Mumbai and Hyderabad, since they generate the most revenue.
- Improve or promote Business hotels in cities like Delhi and Bangalore where the split is closer.
- Overall promote hotels in Delhi and Hyderabad (focus more on Business hotels) where revenue generated is already low

ADR- Avg Daily Rate | **DBRN**- Daily Booked Room Night | **DSRN**- Daily Sellable Room Night | **DURN**- Daily Utilized Room Night | **RevPAR**- Revenue Per Available Room

Property and city wise table showing DSRN, DURN, DBRN

property_id	property_name	city	Total Capacity	Revenue	Occupancy %	Average Rating	Cancellation %	DSRN	DURN	DBRN	Realization %
16559	Atliq Exotica	Mumbai	11132	118.4M	65.92	4.32	24.61	121.00	56.13	79.76	70.31
17563	Atliq Palace	Mumbai	9568	101.5M	66.23	4.29	24.38	104.00	48.67	68.88	70.61
17559	Atliq Exotica	Mumbai	9292	94.0M	66.10	4.32	24.01	101.00	47.27	66.76	70.81
16563	Atliq Palace	Delhi	10764	89.1M	66.40	4.27	25.26	117.00	54.37	77.68	69.91
17560	Atliq City	Mumbai	11316	88.0M	53.14	3.04	25.06	123.00	45.46	65.36	69.51
19562	Atliq Bay	Bangalore	8832	82.4M	65.81	4.28	24.33	96.00	44.51	63.17	70.41
19560	Atliq City	Bangalore	9108	81.9M	65.65	4.28	26.38	99.00	44.92	64.99	69.11
17558	Atliq Grands	Mumbai	9384	74.7M	53.67	3.05	25.66	102.00	38.27	54.74	69.91
17561	Atliq Blu	Mumbai	7820	73.9M	66.28	4.30	24.52	85.00	39.42	56.34	69.91
19561	Atliq Blu	Bangalore	10764	73.0M	53.29	3.08	24.65	117.00	43.51	62.35	69.71
18562	Atliq Bay	Hyderabad	11132	69.3M	65.87	4.30	24.70	121.00	55.93	79.71	70.11
19563	Atliq Palace	Bangalore	10120	68.6M	53.49	3.02	25.35	110.00	40.87	58.84	69.41
17564	Atliq Seasons	Mumbai	8924	66.1M	44.62	2.29	24.79	97.00	30.55	43.28	70.51
18560	Atliq City	Hyderabad	10028	61.0M	66.19	4.26	24.03	109.00	51.22	72.15	70.91
19559	Atliq Exotica	Bangalore	8740	60.0M	53.83	3.05	24.48	95.00	36.23	51.14	70.81
16561	Atliq Blu	Delhi	6716	57.9M	65.78	4.28	25.51	73.00	33.55	48.02	69.81
16562	Atliq Bay	Delhi	9016	56.4M	53.46	3.07	25.27	98.00	36.30	52.39	69.21
18561	Atliq Blu	Hyderabad	9844	56.0M	65.60	4.25	24.17	107.00	49.46	70.20	70.41
16560	Atliq City	Delhi	8740	54.9M	53.70	3.01	24.12	95.00	36.28	51.01	71.11
Total			232576	1708.8M	57.87	3.62	24.83	2,528.00	1,026.21	1,462.93	70.11

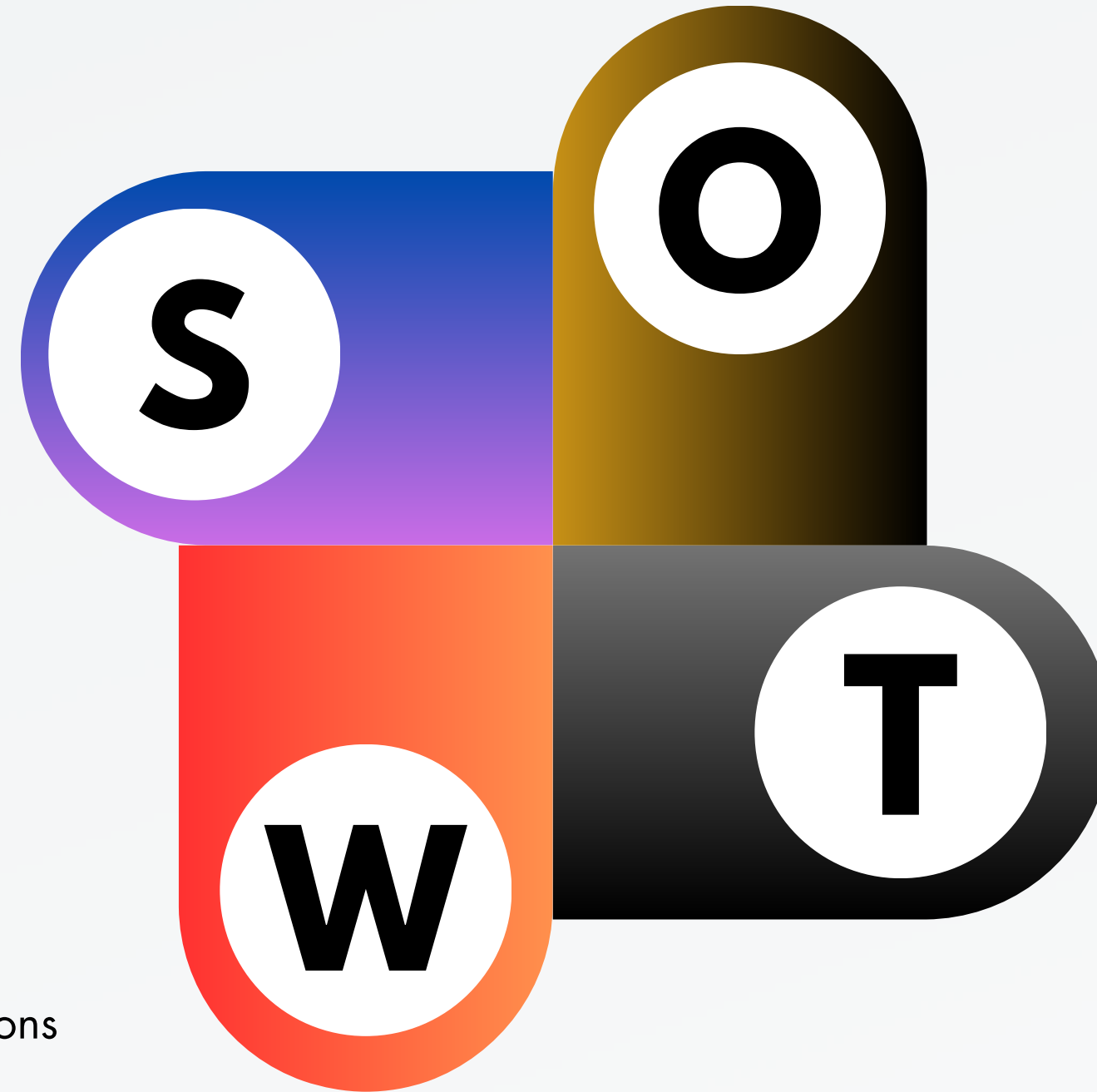
SWOT ANALYSIS

Strengths

- Data-driven KPIs support decision-making
- High revenue from top properties like Exotica & Palace
- Customer ratings remain stable across weeks (need little push)
- Dashboard covers all key performance areas

Weaknesses

- High revenue leakage from cancellations
- Low traffic on direct online platforms
- Underperformance by Seasons & Grands
- Weekday occupancy is inefficient



Opportunities

- Apply non-refundable policy for late bookings (~49% leakage reduction)
- Launch weekday stay & meal bundles
- Upsell premium rooms via offers
- Boost direct booking with loyalty perks

Threats

- Over-reliance on third-party platforms
- High-value cancellations hurt revenue
- Market pressure on weak properties
- Uneven performance across day types

FINAL CONSULTING STRATEGY

01

Planning

Implement non-refundable policy for late bookings

02

Competitive

Promote Presidential rooms via offers

03

Growth

Improve direct online platform adoption

04

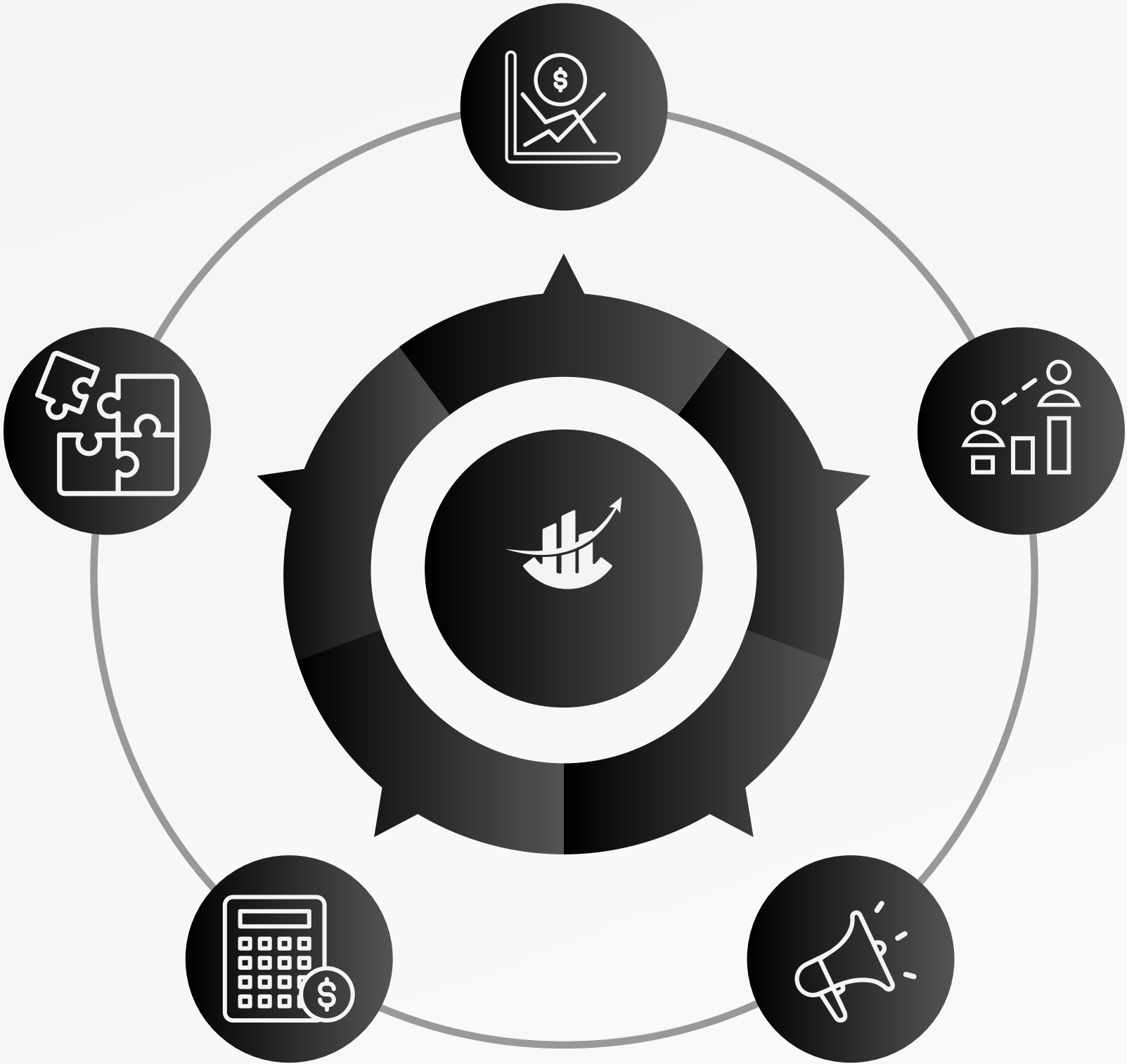
Execution

Target weekday utilization with creative packages

05

Analysis

Study week 32 dip + prepare seasonal campaigns





HOSPITALITY ANALYSIS

CONCLUSION

- Multi-level leakage analysis + solutions
- Platform, pricing, and room-type optimization
- Strong impact from small changes (like non-refundable policy)
- Future scope: cancellation prediction model(ML) , dynamic pricing engine

OUR TEAM

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