Data Overview and Loading

In [1]:

```
import pandas as pd

dim_date = pd.read_excel(r"C:\Users\hp\Downloads\Hospitality data\Dataset\dim_date.
dim_hotels = pd.read_csv(r"C:\Users\hp\Downloads\Hospitality data\Dataset\dim_hotel
dim_rooms = pd.read_csv(r"C:\Users\hp\Downloads\Hospitality data\Dataset\dim_rooms.
fact_aggregated_bookings = pd.read_csv(r"C:\Users\hp\Downloads\Hospitality data\Dat
fact_bookings = pd.read_csv(r"C:\Users\hp\Downloads\Hospitality data\Dataset\fact_b
metrics_list = pd.read_excel(r"C:\Users\hp\Downloads\Hospitality data\Dataset\metri
```

In [2]:

```
print(dim_date.info())
print("\n")
print(dim_hotels.info())
print("\n")
print(dim_rooms.info())
print("\n")
print(fact_aggregated_bookings.info())
print("\n")
print(fact_bookings.info())
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 92 entries, 0 to 91
Data columns (total 4 columns):
 #   Column    Non-Null Count  Dtype
---  ------    --------------  -----
 0   date      92 non-null     datetime64[ns]
 1   mmm yy    92 non-null     datetime64[ns]
 2   week no   92 non-null     object
 3   day_type  92 non-null     object
dtypes: datetime64[ns](2), object(2)
memory usage: 3.0+ KB
None


<class 'pandas.core.frame.DataFrame'>
RangeIndex: 25 entries, 0 to 24
Data columns (total 4 columns):
 #   Column         Non-Null Count  Dtype
---  ------         --------------  -----
 0   property_id    25 non-null     int64
 1   property_name  25 non-null     object
 2   category       25 non-null     object
 3   city           25 non-null     object
dtypes: int64(1), object(3)
memory usage: 928.0+ bytes
None


<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4 entries, 0 to 3
Data columns (total 2 columns):
 #   Column      Non-Null Count  Dtype
---  ------      --------------  -----
 0   room_id     4 non-null      object
 1   room_class  4 non-null      object
dtypes: object(2)
memory usage: 192.0+ bytes
None


<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9200 entries, 0 to 9199
Data columns (total 5 columns):
 #   Column               Non-Null Count  Dtype
---  ------               --------------  -----
 0   property_id          9200 non-null   int64
 1   check_in_date        9200 non-null   object
 2   room_category        9200 non-null   object
 3   successful_bookings  9200 non-null   int64
 4   capacity             9200 non-null   int64
dtypes: int64(3), object(2)
memory usage: 359.5+ KB
None


<class 'pandas.core.frame.DataFrame'>
RangeIndex: 134590 entries, 0 to 134589
Data columns (total 12 columns):
 #   Column             Non-Null Count   Dtype
---  ------             --------------   -----
 0   booking_id         134590 non-null  object
 1   property_id        134590 non-null  int64
 2   booking_date       134590 non-null  object
 3   check_in_date      134590 non-null  object
 4   checkout_date      134590 non-null  object
 5   no_guests          134590 non-null  int64
 6   room_category      134590 non-null  object
 7   booking_platform   134590 non-null  object
 8   ratings_given      56683 non-null   float64
 9   booking_status     134590 non-null  object
 10  revenue_generated  134590 non-null  int64
 11  revenue_realized   134590 non-null  int64
dtypes: float64(1), int64(4), object(7)
memory usage: 12.3+ MB
None
```

Data Transformation and Merging

In [3]:

```
fact_bookings['check_in_date'] = pd.to_datetime(fact_bookings['check_in_date'])

merged_data = pd.merge(fact_bookings, dim_date, left_on="check_in_date", right_on='
merged_data = pd.merge(merged_data, dim_hotels, on="property_id", how="left")
merged_data = pd.merge(merged_data, dim_rooms, left_on="room_category", right_on="r
```

In [4]:

```
merged_data
```

Out[4]:

	booking_id	property_id	booking_date	check_in_date	checkout_date	no_guests
0	May012216558RT11	16558	2022-04-27	2022-05-01	2022-05-02	3
1	May012216558RT12	16558	2022-04-30	2022-05-01	2022-05-02	2
2	May012216558RT13	16558	2022-04-28	2022-05-01	2022-05-04	2
3	May012216558RT14	16558	2022-04-28	2022-05-01	2022-05-02	2
4	May012216558RT15	16558	2022-04-27	2022-05-01	2022-05-02	4
...	...	...	...	...	...	...
134585	Jul312217564RT46	17564	2022-07-29	2022-07-31	2022-08-03	1
134586	Jul312217564RT47	17564	2022-07-30	2022-07-31	2022-08-01	4
134587	Jul312217564RT48	17564	2022-07-30	2022-07-31	2022-08-02	1
134588	Jul312217564RT49	17564	2022-07-29	2022-07-31	2022-08-01	2
134589	Jul312217564RT410	17564	2022-07-31	2022-07-31	2022-08-01	2

134590 rows × 21 columns

Handling Missing Values and Key Metrics Calculation

In [5]:

```
merged_data['ratings_given'].fillna(0, inplace=True)
merged_data = merged_data.dropna(subset=['revenue_generated', 'ratings_given', 'no_
```

In [6]:

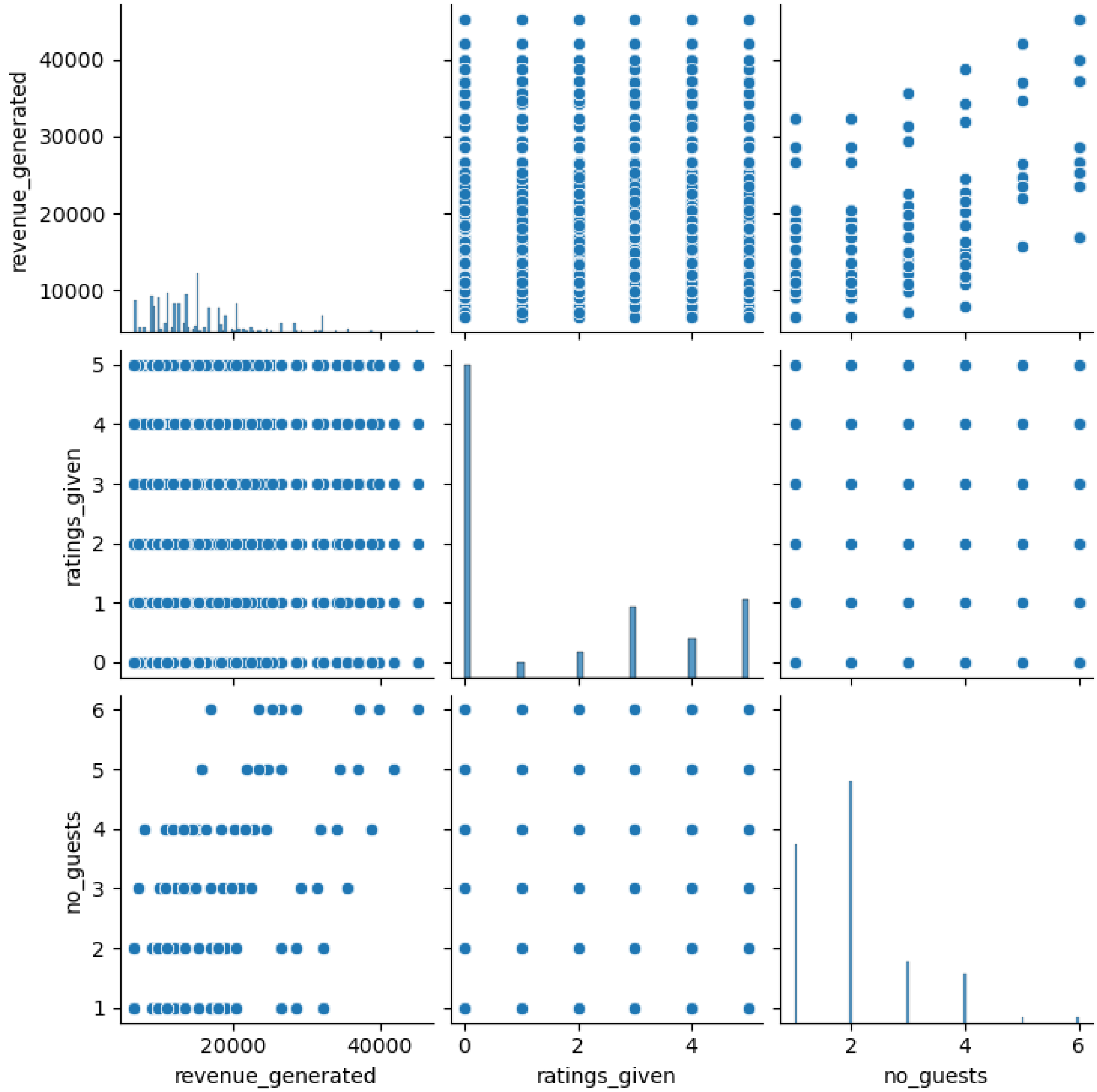
```
total_bookings = merged_data['booking_id'].count()
total_successful_bookings = merged_data[merged_data['booking_status'] == "Checked O

average_rating = merged_data['ratings_given'].mean()
total_capacity = merged_data['room_category'].nunique()
total_cancelled_bookings = merged_data[merged_data['booking_status'] == "Cancelled'
cancellation_rate = (total_cancelled_bookings / total_bookings) * 100

print(f"Total Bookings: {total_bookings}")
print(f"Total Successful Bookings: {total_successful_bookings}")
print(f"Average Rating: {average_rating}")
print(f"Total Capacity: {total_capacity}")
print(f"Total Cancelled Bookings: {total_cancelled_bookings}")
print(f"Cancellation Rate: {cancellation_rate}")
```

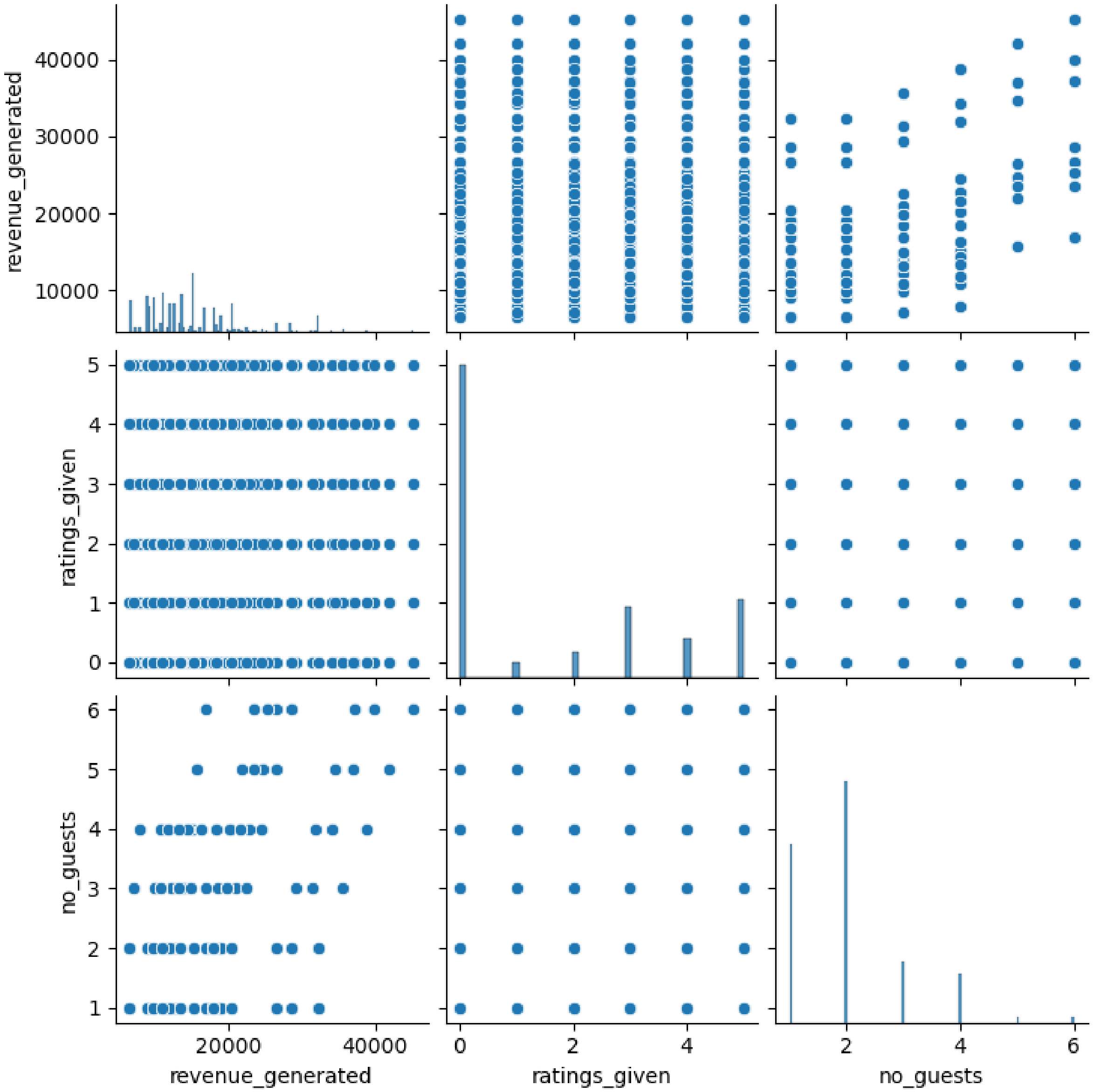
```
Total Bookings: 134590
Total Successful Bookings: 94411
Average Rating: 1.5241548406270897
Total Capacity: 4
Total Cancelled Bookings: 33420
Cancellation Rate: 24.830968125417936
```

Data Distributions and Relationships

In [10]:

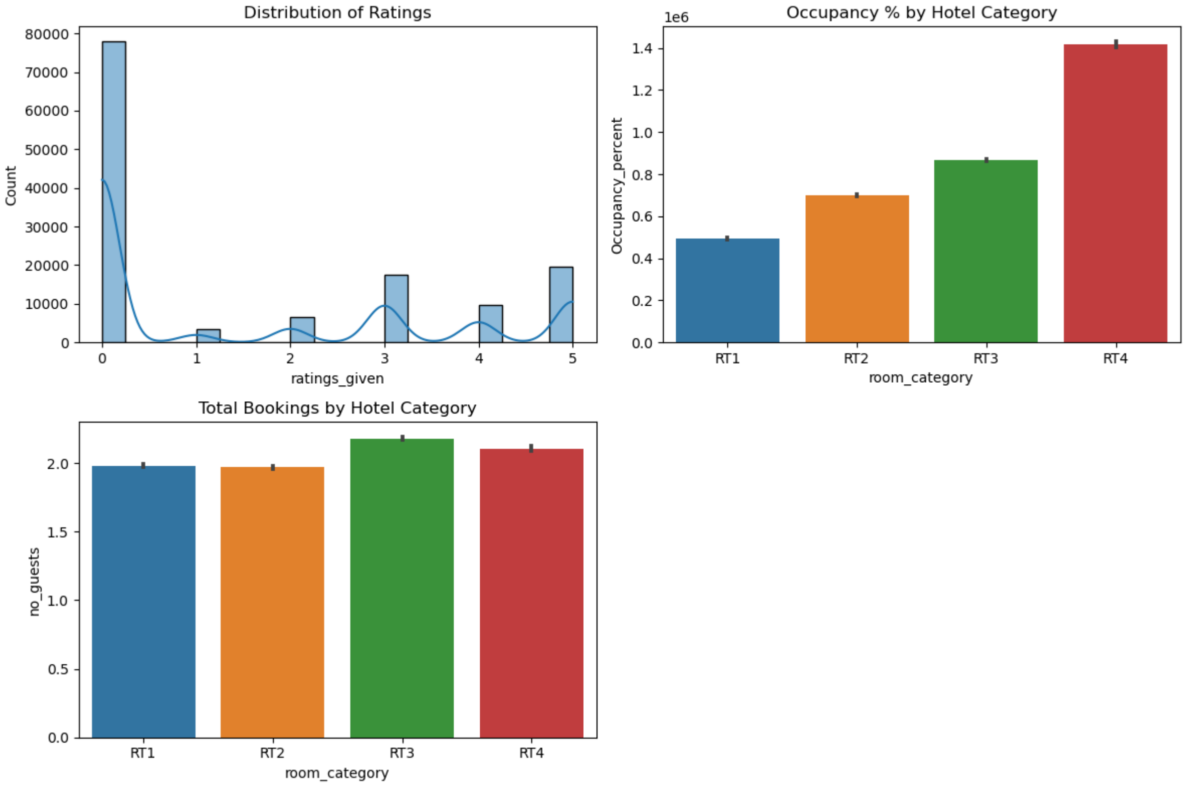
```
import seaborn as sns
import matplotlib.pyplot as plt
sns.pairplot(merged_data[['revenue_generated', 'ratings_given', 'no_guests', 'week
plt.show()
```


revenue_generated
40000
30000
20000
10000
ratings_given
5
4
3
2
1
0
no_guests
6
5
4
3
2
1
20000
40000
revenue_generated
0
2
4
ratings_given
2
4
6
no_guests

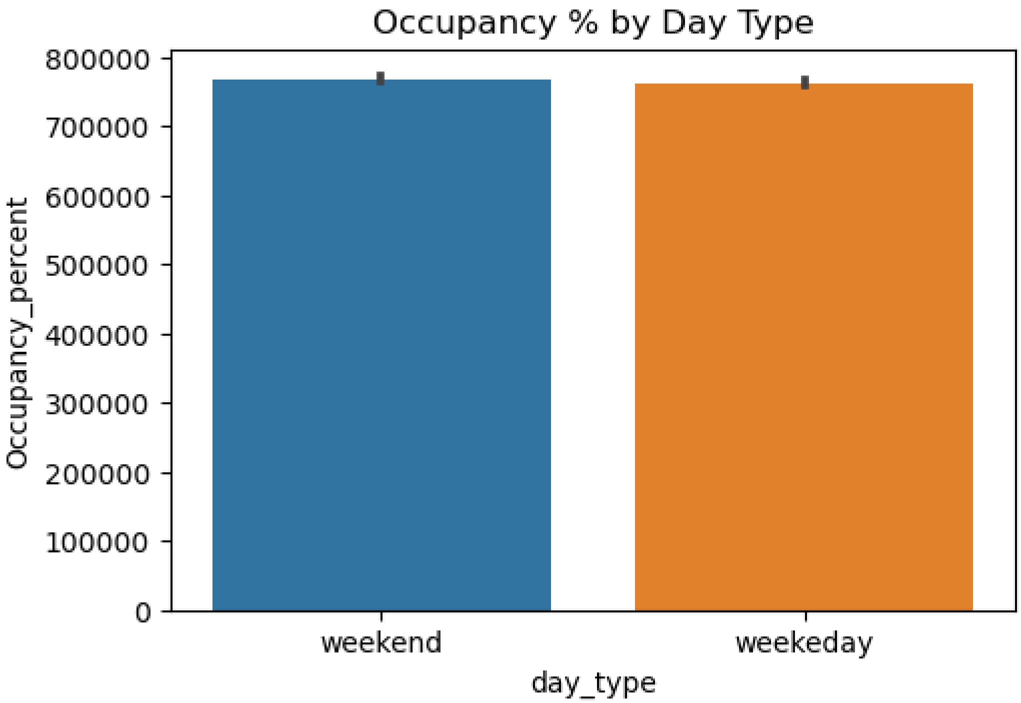


Additional Metrics Calculation and Plots

In [11]:
```
merged_data['Occupancy_percent'] = (merged_data['revenue_realized'] / merged_data['
merged_data['Cancellation Rate'] = (merged_data['booking_status'] == "Cancelled").m

# Plot 1: Distribution of Ratings
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
sns.histplot(merged_data['ratings_given'], bins=20, kde=True)
plt.title('Distribution of Ratings')

# Plot 2: Occupancy Percentage by Hotel Category
plt.subplot(2, 2, 2)
sns.barplot(x='room_category', y='Occupancy_percent', data=merged_data)
plt.title('Occupancy % by Hotel Category')

# Plot 3: Bar plot of Total Bookings
plt.subplot(2, 2, 3)
sns.barplot(x='room_category', y='no_guests', data=merged_data)
plt.title('Total Bookings by Hotel Category')

plt.tight_layout()
plt.show()
```



In [12]:
```
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 4)
sns.barplot(x='day_type', y='Occupancy_percent', data=merged_data)
plt.title('Occupancy % by Day Type')
plt.show()

plt.figure(figsize=(12, 8))
```

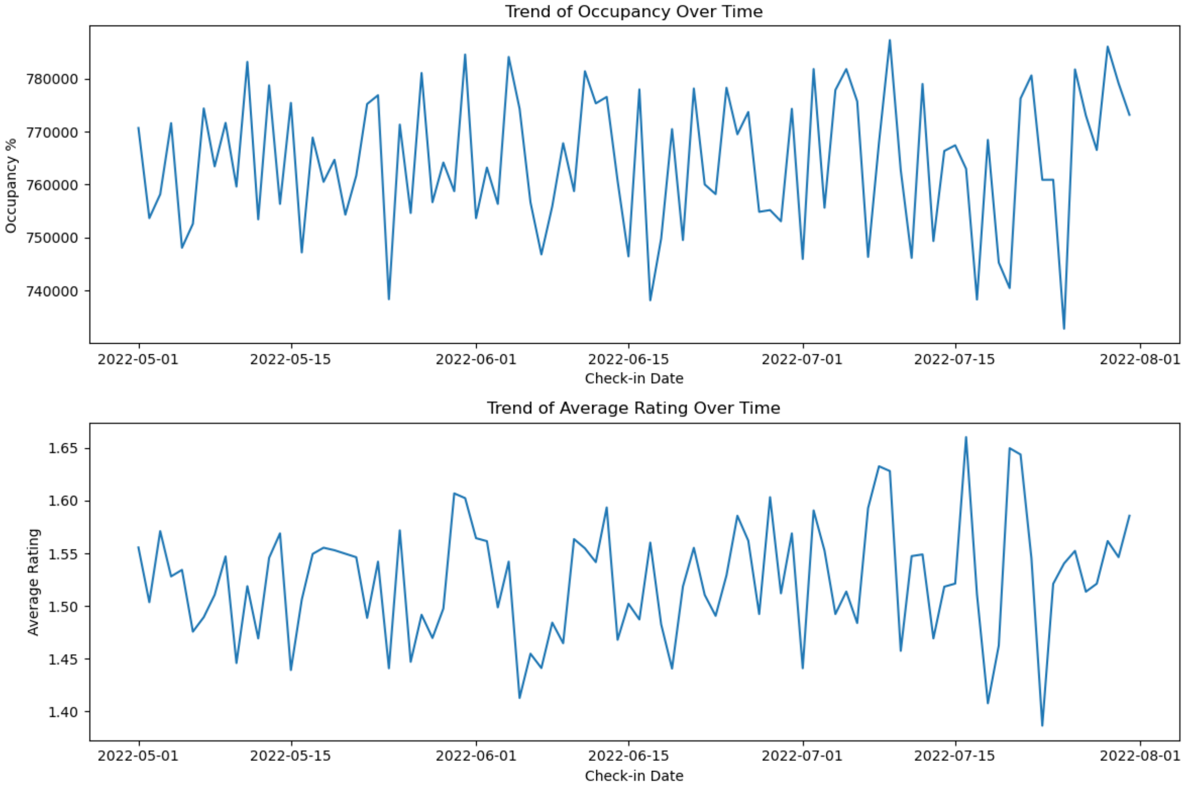


Out[12]:
```
<Figure size 1200x800 with 0 Axes>
```

Occupancy Trends and Additional Plots

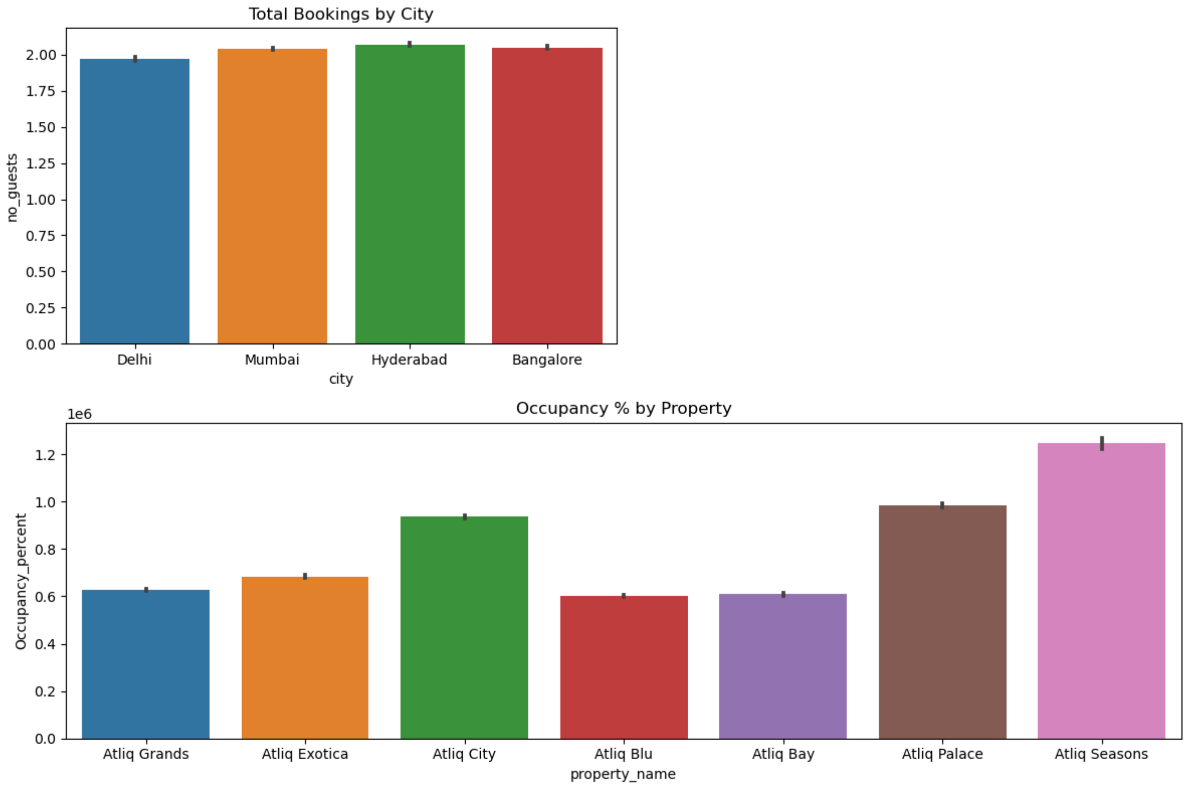
In [13]:
```
# Trend 1: Occupancy over time
plt.subplot(2, 1, 1)
sns.lineplot(x='check_in_date', y='Occupancy_percent', data=merged_data, ci=None)
```

```
plt.title('Trend of Occupancy Over Time')
plt.xlabel('Check-in Date')
plt.ylabel('Occupancy %')

# Trend 2: Average Rating over time
plt.subplot(2, 1, 2)
sns.lineplot(x='check_in_date', y='ratings_given', data=merged_data, ci=None)
plt.title('Trend of Average Rating Over Time')
plt.xlabel('Check-in Date')
plt.ylabel('Average Rating')

plt.tight_layout()
plt.show()
```



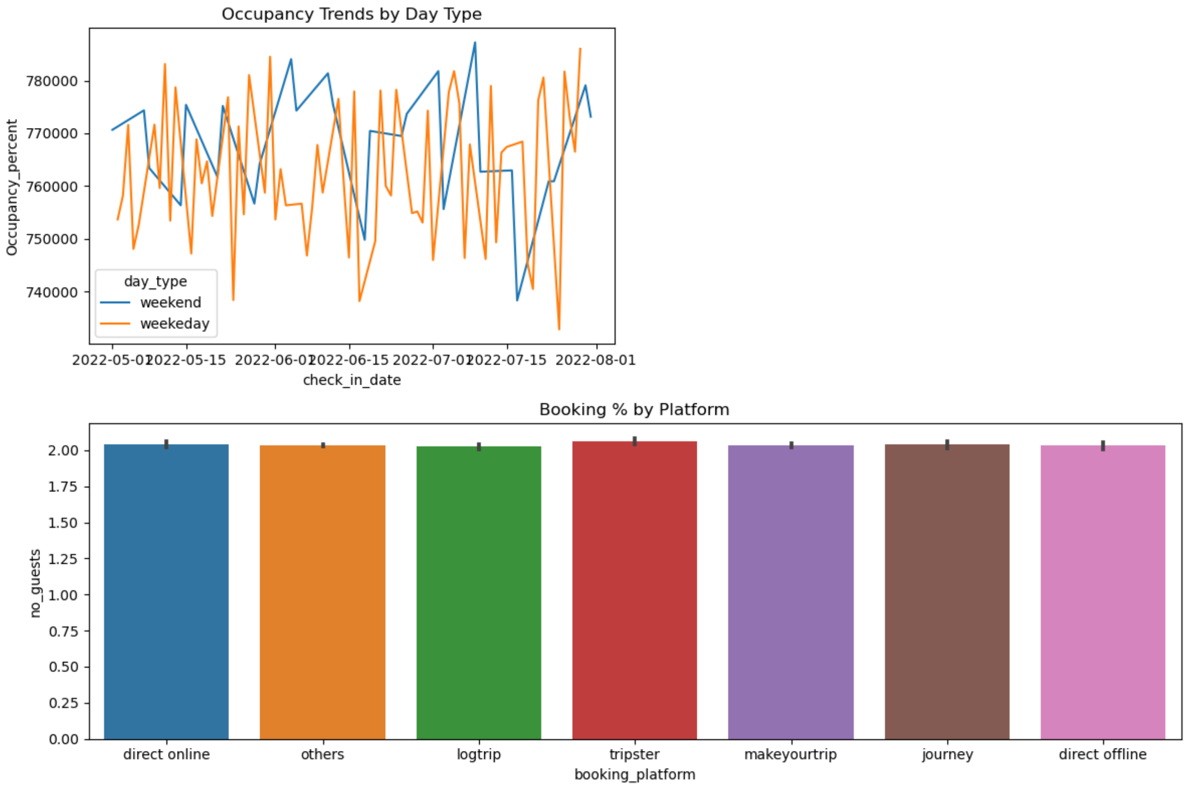
In [14]:

```
# Plot 4: Bar plot of Total Bookings by City
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
sns.barplot(x='city', y='no_guests', data=merged_data)
plt.title('Total Bookings by City')

# Plot 5: Occupancy Percentage by Property
plt.subplot(2, 1, 2)
sns.barplot(x='property_name', y='Occupancy_percent', data=merged_data)
plt.title('Occupancy % by Property')

plt.tight_layout()
plt.show()
```



In [15]:

```
# Plot 6: Trends by day type
plt.figure(figsize=(12, 8))
plt.subplot(2, 2, 1)
sns.lineplot(x='check_in_date', y='Occupancy_percent', hue='day_type', data=merged_
plt.title('Occupancy Trends by Day Type')

# Plot 7: Booking % by platform
plt.subplot(2, 1, 2)
sns.barplot(x='booking_platform', y='no_guests', data=merged_data)
plt.title('Booking % by Platform')

plt.tight_layout()
plt.show()
```



In [ ]: