Data Source: https://www.kaggle.com/datasets/ad043santhoshs/hospitality-domain

Introduction

Data Visualization is the graphical representation which is used to display data/big data in various graphical forms, such as charts, diagrams, pie-chart, maps, graphs, etc. Through these graphs, patterns or trends can be observed. Data Visualization is being used in various fields, including but not limited to, science, business, finance, healthcare, etc. According to the field of hospitality and the data provided regarding that, an appropriate graphical representation is used to detect trends or patterns. With graphical representation, the decision-making gets easier, and the user gets a better insight into their business. Effective data visualisation is a clear and precise representation of the data by using appropriate charts, so that the user gets more easily understandable information about the data. There are various tools available for data visualisation, but Tableau and Microsoft Power BI are the ones more commonly used.

AtliQ

AtliQ is a prestigious hotel chain with various 5-star hotels and is a leading player in the hospitality industry in multiple cities of India for the last 20 years. The company's main focus is to provide a premium experience to its customers. AtliQ provides services to its guests in the form of first-rate facilities, first-rate service, and a dedication to guest satisfaction in every possible way.

Data Dictionary

The dataset acquired contains the following information about the hotels of AtliQ Group:

S NO.	Field Name	Data Type	Notes
1	booking_id	Integer	Unique identifier for each booking.
2	property_id	Integer	Unique identifier for each property/hotel.
3	booking_date	Date	Date when the booking was made.
4	Month Name	String	Month name corresponding to the booking date.
5	Day Name	String	Day name corresponding to the booking date.
6	Weekday	String	Weekday corresponding to the booking date (e.g., Monday, Tuesday, etc.)
7	no_guests	Integer	Number of guests for the booking.
8	room_category	String	Category of the room booked (e.g., standard, deluxe, etc.).
9	booking_platform	String	Platform used for making the booking (e.g., online travel agency, direct booking, etc.).
10	ratings_given	Float	Ratings given by guests for the booked property.
11	booking_status	String	Status of the booking (e.g., confirmed, cancelled, etc.).
12	revenue_generated	Float	Revenue generated from the booking.
13	revenue_realized	Float	Actual revenue realized from the booking.
14	Revenue_lost	Float	Amount of revenue lost due to cancellations or other reasons.
15	Week of Year	Integer	Week number of the booking date in the year.
16	No of Days	Integer	Number of days of the booking.
17	dim_rooms	String	Dimensional information about the rooms booked (e.g., size, amenities, etc.).
18	property_name	String	Name of the property/hotel.
19	Category	String	Category of the property/hotel (e.g., luxury, business, etc.).
20	City	String	City where the property/hotel is located.
21	successful_bookings	Integer	Number of successful bookings for the property/hotel.
22	Capacity	Integer	Capacity or total number of rooms available in the property/hotel.
23	Unsuccessful_bookings	Integer	Number of unsuccessful bookings for the property/hotel.

Persona:

AtliQ group of hotels is one of the leading groups in the hospitality sector with various 5-stars hotels located in 4 major cities of India. We have been in the business of hospitality for the last 20 years. My role as an MD includes keeping an eye on the Key Performance Indicators (KPIs) such as the number of guests that visited the venues, revenue generated, revenue lost, revenue realised, from which booking platform we are getting the guest at our venue, and the number of successful and unsuccessful bookings. These factors determine the growth of our company in terms of capital.

To maintain and improvise customer satisfaction, my role is to keep an eye on some of the KPIs which are ratings provided by each booking id, the day of the booking, whether the category of the venue is luxury or business based, and the capacity of the property along with that we also maintain the data of date of the booking, booking Id, city of the booking, property of the booking, whether it is a weekday booking or weekend booking, day, room category used by the guest, and how many days the guest stays. Overall, to satisfy the guest of our venues as well as the investors who have invested in our company and to improve the reputation as an organisation in the hospitality business, I am supposed to look after various data-driven factors, and with the help of visualisation, the decision making gets much easier as well as taking strategic decision-making. In this new age of technology, to keep up with the competitors we maintain all aforementioned data to use it for better decision-making with the help of data visualisation.

Question Formulation

Q1.) How does the rate of successful and unsuccessful bookings depend on the booking platform with respect to the room type? Subsequently, does the number of bookings made by a specific property depend on the capacity of the hotel and/or on which day of the week it was booked?

Q2.) What is the revenue generated from each property which comes in all cities as well as the total revenue generated per city (to see which city is doing how much business)? Does the amount of revenue generated vary with respect to specific days of the week?

These are the questions which I would like to focus on from the data of my company with the help of data visualization for better decision-making and growth.

User Requirement Specification

R1.) To provide the visual representation of the above question a line chart is created where the trend between successful and unsuccessful bookings is on the Y-axis and the variable of room category and booking platform is on the X-axis. And tree maps are designed to find out the number of bookings and the number of available rooms according to the day name as well as the type of the room.

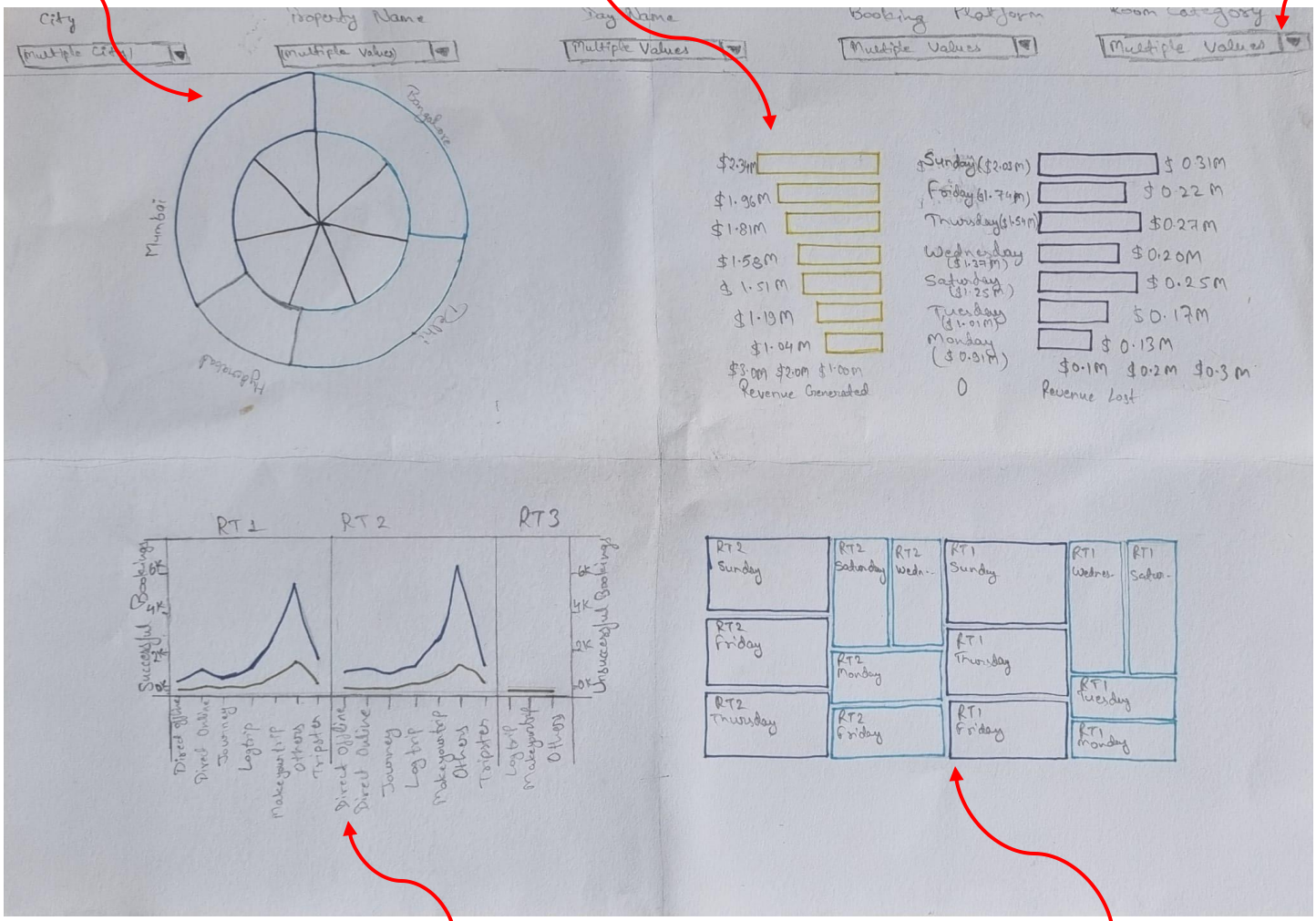
R1.) To provide visualised information on this question a donut chart is designed to obtain information on revenue realised in different cities along with the revenue obtained from every venue. To provide the revenue realised, generated, and lost according to the day of the week, a butterfly chart is used.

DESIGN

1.) This chart shows the information of revenue realized in each property of all the city by overlapping two pie charts on each other, making a donut (Q2).

2.) The chart shows the revenues realized, lost and generated on each of the week (Q2).

3.) Filters to get the information according to the need. And they can be coordinated with each other so that if we use one filter then the changes will reflect on all the sheets and we can use multiple filters at a time according to our convenience.



4.) This is the line trend which represent the rate of successful and unsuccessful bookings (Y-axis) based on the booking platform on which the booking was done (X-axis), with the information of room type (X-axis) of the booking as well

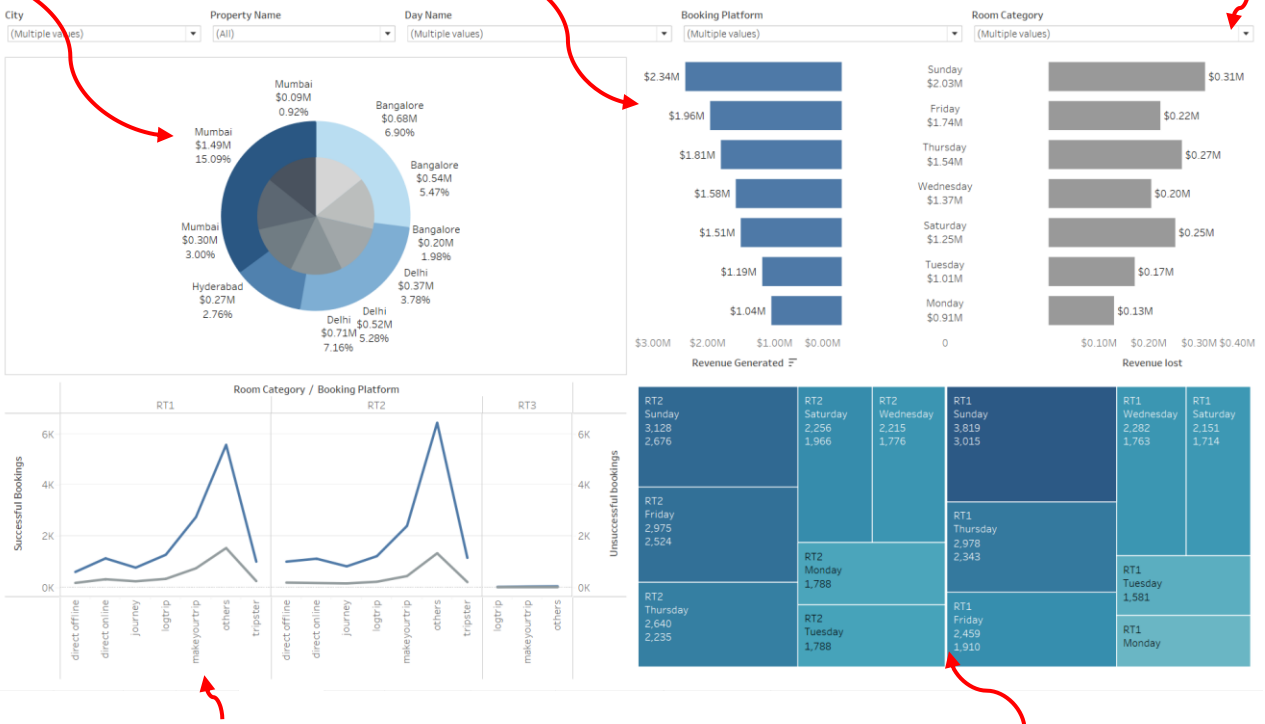
5.) This graph provides the data of successful bookings, capacity, room type and the day of the week as well by representing the in textual form (Q1).

This is the final dashboard which was designed with the help of 4 worksheets. This dashboard has been created with the help of different types of charts based on information provided by the data set to answer the question that a managing director would have had. This dashboard provides information on revenue realised, generated, and lost with respect to various factors like the day of the week, property, city, etc. It also shows the visualised information of how the number of successful and unsuccessful bookings varies with the booking platform and the number of bookings effectuated on different days of the week along with the capacity of different room types of all the hotels.

1.) Donut chart shows the revenue realized in each property of all the city (Q2).

2.) The butterfly chart represents the revenues realized, lost and generated on each of the weeks (Q2).

3.) Filters of city, property name, day name, booking platform, and room category in dropdown format provides options to see the data according to the need. (If you want to see only the data of Delhi city then you can select only Delhi from city filter and then all sheets will show you the data in Delhi only)



4.) This is the line chart which represent the rate of successful and unsuccessful bookings based on the booking platform on which the booking was done, with the information of room type of the booking as well (Q1).

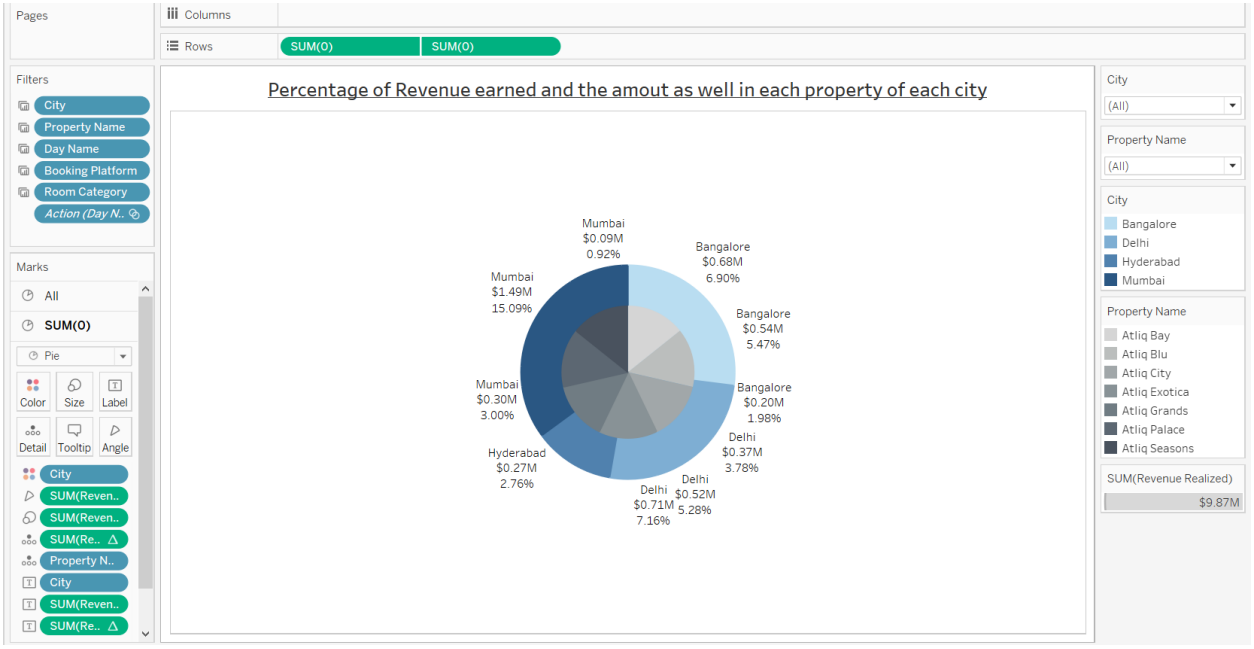
5.) These tree maps provide the data of successful bookings, capacity, room type and the day of the week as well (Q1)

This is the final product of the work done represented in the dashboard on Tableau and as can be seen, the information taken from this dashboard could be quite useful in terms of improving customer service as well as increasing the revenue for the company. A comparison of various variables in the form of graphs and charts can be obtained, from which valuable insights/trends about the data can be determined.

Implementation

To get the visualised data for question 1, two worksheets are used one of which is a donut chart. It is generated with the help of variables like City, property name, and Revenue realised along with some filters (like city and property name) to get specific information about any city/property in case needed. Two pie charts were overlapped to create the Donut Chart. The size of both pie charts was changed. The city and property were defined in the inner and outer circle respectively with colour marks and textual representation of the percentage of revenue realised by each property in every city as well as which property belongs to which city.

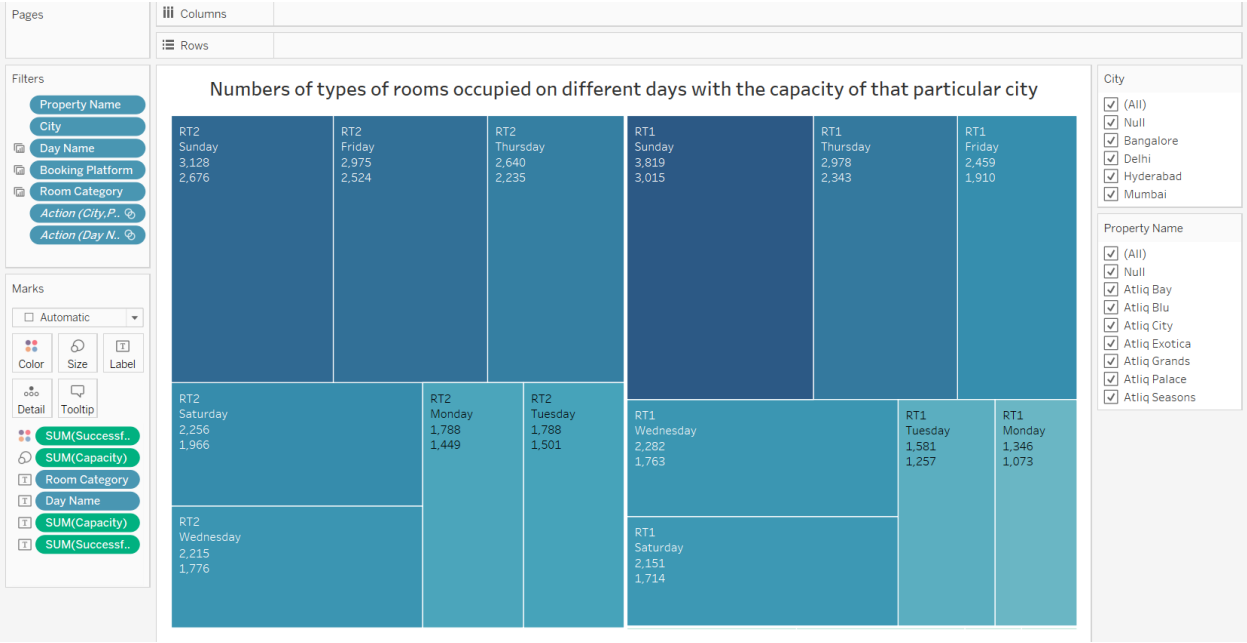
Sheet 1:



The research provides a summary of the income produced by every property and city, detecting trends and patterns. It enables stakeholders to find high-performing properties and cities and increase profitability by assisting in the decision-making process for resource allocation, marketing plans, and company operations. Mumbai looks to be the city that generates the most money out of all the cities under consideration, according to the statistics provided.

Sheet 2:

The second worksheet provides the desired output. This treemap helps to resolve the second query of the first question by using factors like the number of successful bookings, day name, capacity and room type. All these factors were dragged and dropped in the label. In addition to that, the city and property name was added to the filters, so that the information can be accessed according to some particular city and property name if needed.

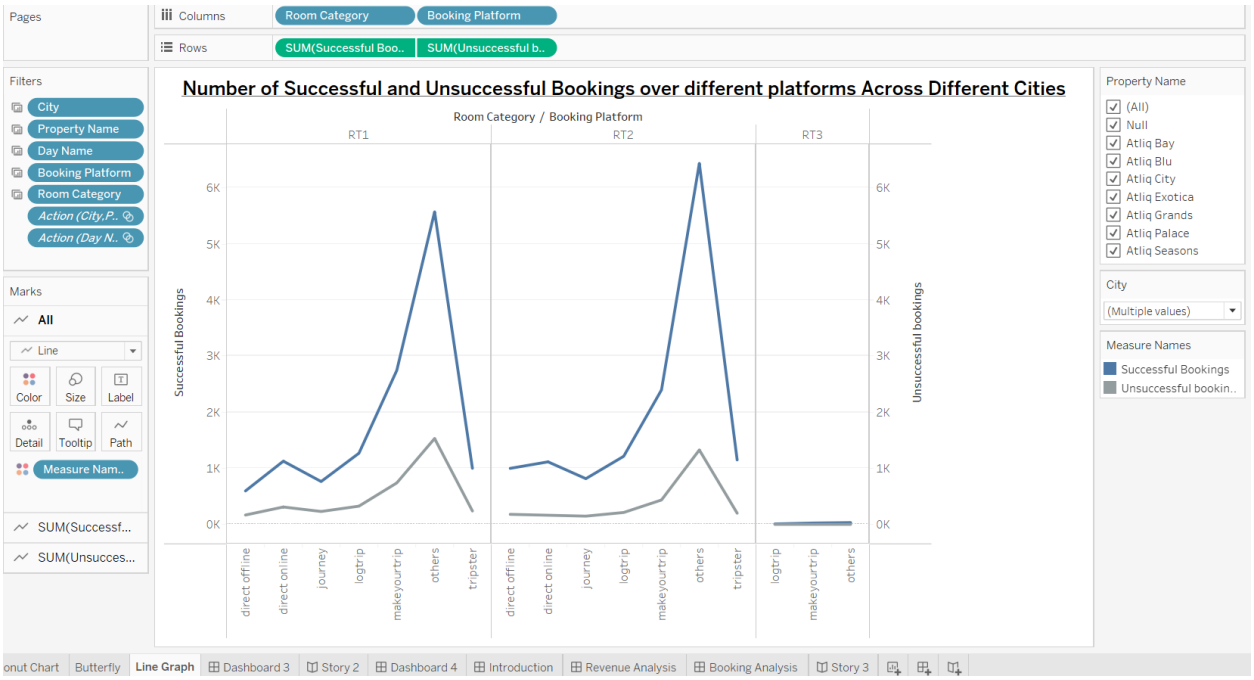


With the help of the present study, we can look at how the kind of room, the day of the week, and the number of confirmed reservations relate to one another. Sundays had the most reservations, with Fridays and Thursdays coming in second and third.

Sheet 3:

In this section, the first query of the second question which is to look for any trend between successful and unsuccessful booking and booking platforms is determined using the line graph. A graph of the sum of successful bookings with the sum of unsuccessful bookings (rows) is plotted against the room category with the booking platform (column).

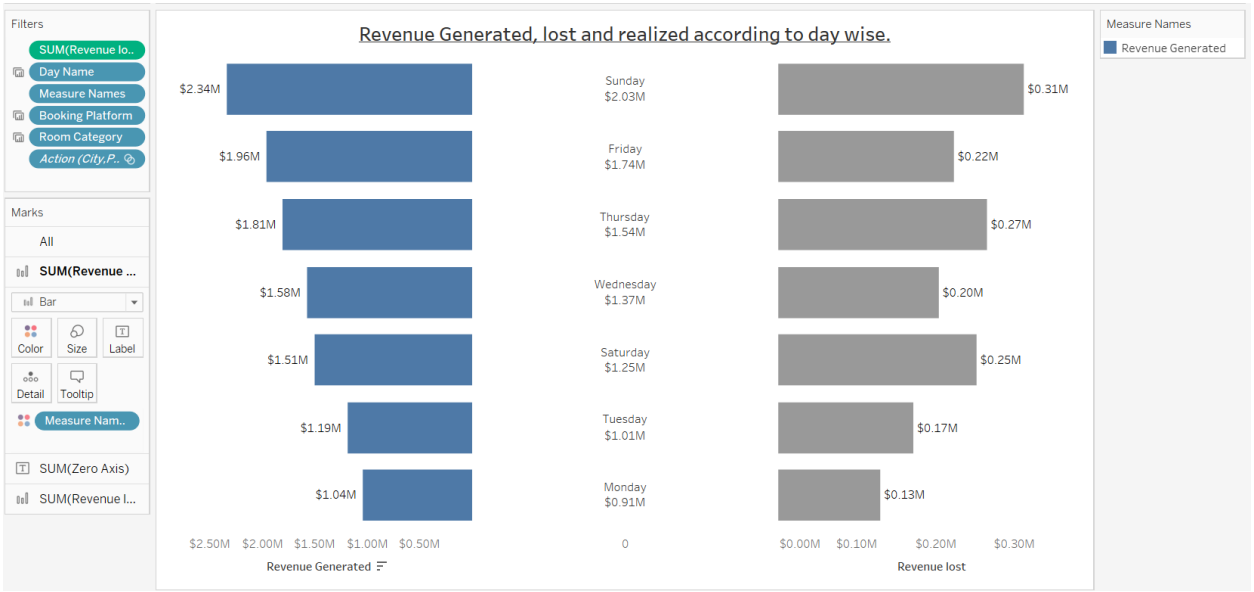
The city, as well as the property name filter, were applied to check the variation in the graph according to the need.



According to the data presented, it appears that the "others" booking platform was used for the bulk of reservations, both successful and unsuccessful.

Sheet 4:

A butterfly graph was created to resolve the second issue of the second question. From this graph, the revenue generated, lost and realised with respect to the day of the week is known. To create this graph, the revenue generated and lost were classified in columns. Additionally, a new variable named Xero axis was created, and dragged and dropped to show the day name and revenue realised to it.



We can observe from the findings here how income gained, and revenue lost fluctuate depending on the day of the week. By looking at the booking data, we can see any patterns or trends and learn important things about how our consumers book. This data helps in strategic pricing, marketing, and operational planning choices.

Walkthrough

After implementing the visualisation, the graphs demonstrate various facts such as on which day of the week the highest amount of revenue is gained as well as which city the highest amount of revenue comes from (Mumbai, Bangalore, Delhi, and Hyderabad in descending order in terms of revenue). Along with the information about the revenue, the trends in bookings, such as from which booking platform the highest number of successful and unsuccessful bookings with respect to room categories, were obtained. This analysis made it possible to determine the number of successful bookings in accordance with the capacity of the hotel on particular days of the week with respect to the room type.

To get this output, 4 worksheets were created. A dashboard was designed by combining those worksheets and their filters. Initially, for the first requirement, a line chart was created to show the rate of successful/unsuccessful bookings based on the platform of booking and room type, and then a treemap was used to represent the number of successful bookings with capacity for a particular room type on every day of the week. For the second requirement, two graphs were designed: the donut chart and the butterfly chart. The donut chart is representing revenue realised in each city as well as its property on the other hand the butterfly chart shows the revenue realised, lost and generated based on the day of the week.

Story:

I have created a narrative using my data visualisations using Tableau's story tool. To further help the audience in understanding the insights I have discovered, text, photos, and notes were added to my visualisations. The function enables me to direct the information's flow and emphasise the most crucial results, which makes it simpler for the audience to follow the tale. I can successfully explain difficult information and make better judgements if I can use my data to tell a whole story.

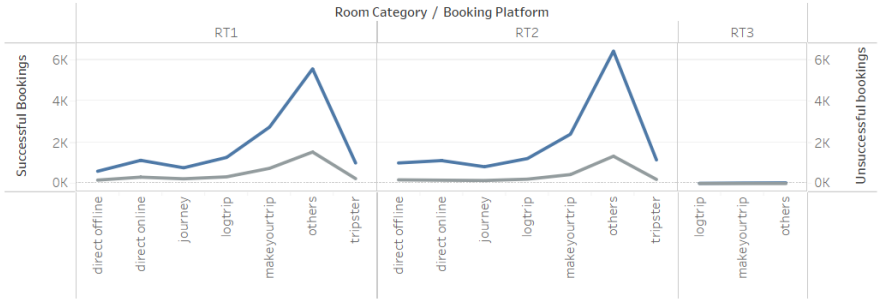
ATLIQ GRAND

A trusted and well-known name in the Indian hospitality sector is AtliQ Grands. AtliQ Grands has been a dominant force in the industry for the past 20 years, successfully operating in several cities like Delhi, Mumbai, Bangalore, and Hyderabad. The business takes great satisfaction in providing customers with unmatched customer experiences and top-notch hospitality services. AtliQ Grands understands the value of being one step ahead of the competition and adjusting consistently to the shifting industry trends. AtliQ Grands continues to uphold its position as a top-tier participant in the Indian hospitality industry by continually exceeding client expectations and utilising cutting-edge technologies.

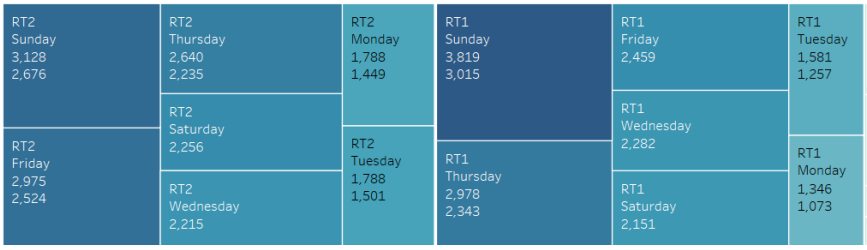
ATLIQ GRAND

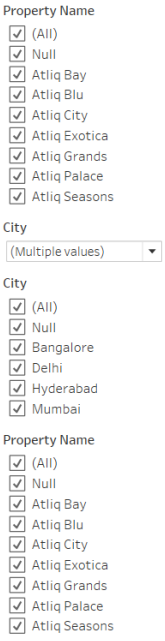
ATLIQ GRAND

Number of Successful and Unsuccessful Bookings over different platforms Across Different Cities



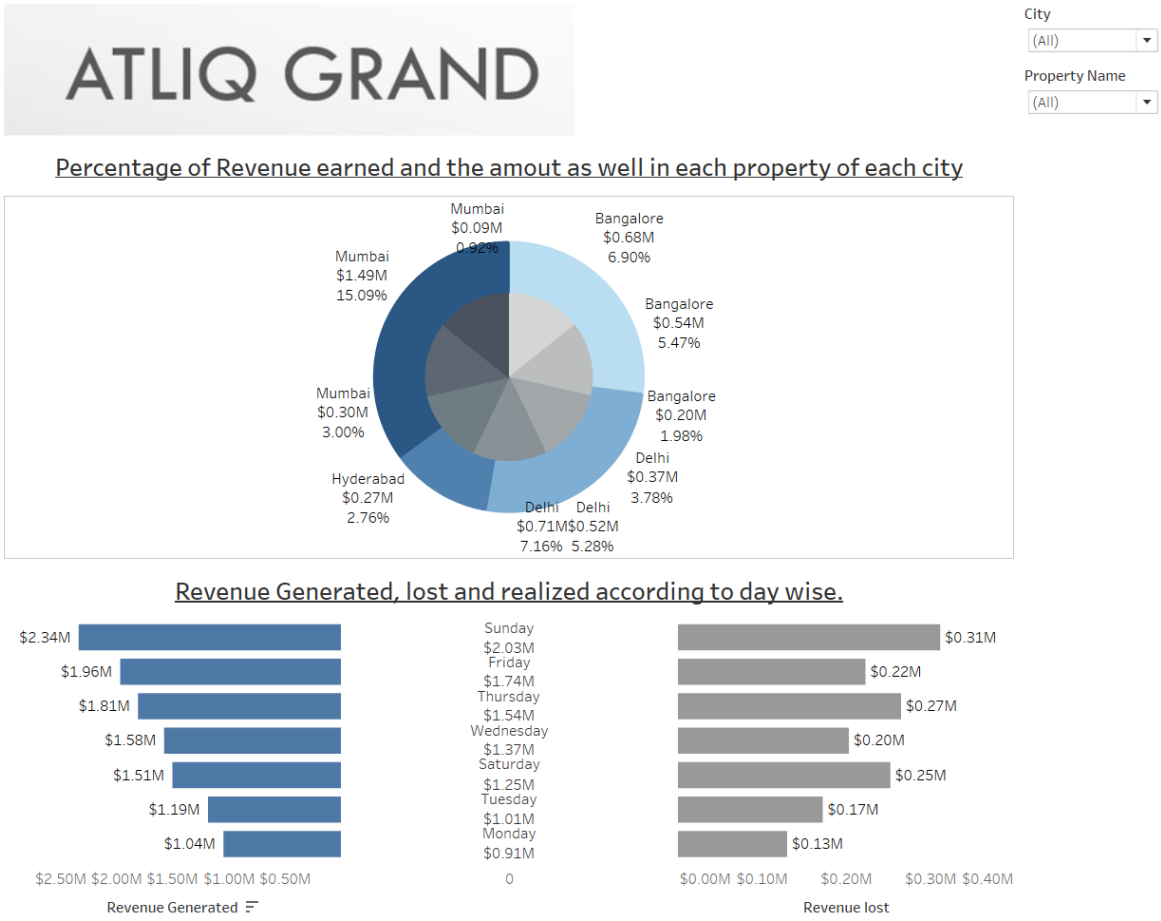
Numbers of types of rooms occupied on different days with the capacity of that particular city





Revenue Analysis

This study evaluates hotel revenue in several AtliQ Grands cities to highlight distinctions between hotels and communities. To optimise operations and increase profitability, the income realised, lost, and gained in relation to length of stay are examined. The most lucrative city is Mumbai with the most pricing and marketing tactics. Lucrative day is Sunday. To grow revenue streams and keep market dominance, this information may be utilised to inform strategic decision-making regarding.



Booking Analysis

The analysis's objective is to ascertain the success and failure rates of bookings for lodging made through various channels, as well as the days of the week and room capacities. According to the statistics, the bulk of reservations were made through the "others" booking platform category, and Sundays saw the greatest number of reservations for both forms of lodging. Making strategic decisions about resource allocation and marketing strategies based on this data can help the hotel sector increase profits and improve guest happiness. To satisfy evolving customer preferences and needs, a data-driven approach is essential.

Conclusion

The use of visualisations like line charts, tree maps, donut charts, and butterfly charts has assisted in providing key insights into critical issues like the ratio of successful to unsuccessful bookings, the number of bookings made by a particular property, and the revenue produced by each property and city. The company may boost their income and make better use of its resources by making educated decisions based on this information. They may use the information acquired from these visualisations as a useful tool to remain competitive in a sector that is continuously evolving.

Reflective Discussion

Looking at the correlation between customer evaluations and the type of room in each hotel or resort will allow for further investigation and more insights. To do this, a Tableau worksheet is created using the parameters "property_name" and "City" and the values "room_category" and "ratings_given". The relationship between the room category and visitor ratings is observed by using appropriate visualisation techniques, such as scatter plots, box plots, or heat maps. Additionally, the spreadsheet may be filtered to examine ratings for certain properties/hotels, localities, or periods. Calculated fields can be added to the worksheet to determine metrics like the average rating for each room type or the percentage of bookings that received a particular rating. To provide context and insights, the worksheet's labels, colours, and font size are changed and a descriptive title and captions are added. Finally, for more accessibility and collaboration, the worksheet may be published to the Tableau Server or Tableau Online and can therefore be shared with the team or stakeholders.

Comparison between Power BI vs Tableau

- The ownership and licencing of Power BI and Tableau differ noticeably; the former is a Microsoft product licenced on a per-user basis, whilst the latter is owned by Salesforce and is licenced either on a per-user or per-server basis.
- Tableau provides greater possibilities for interacting with third-party apps and data sources, whereas Power BI has tighter integration with other Microsoft products.
- Tableau is renowned for its sophisticated charting and visualisation tools, whereas Power BI features a more approachable user interface for making straightforward charts and visualisations.
- Power BI is a superior option for data manipulation and analysis to Tableau since it offers more powerful data modelling and ETL features.
- Power BI is mainly geared towards individual user analysis, whereas Tableau includes more collaboration capabilities, such as the ability to create and share interactive dashboards with multiple users.
- For iOS and Android devices, Power BI's mobile app is more feature-rich whereas Tableau's mobile app offers fewer options.

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