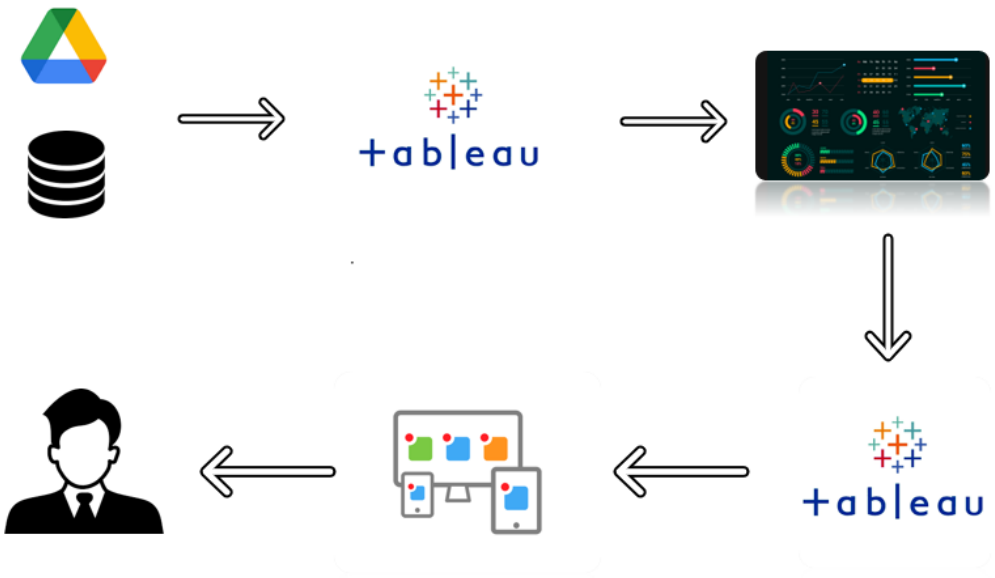
Analysing the Performance & Efficiency of The Radisson Hotels using Data Visualization Techniques

The hotel industry is a broad category of businesses that provide lodging services for travellers and tourists. This can include a wide range of establishments, from luxury resorts to budget-friendly motels, as well as extended stay hotels, boutique hotels, and more. Hotels can be found in nearly every corner of the world, and are often a major component of the tourism and travel industry in a given area.

Radisson owns multiple five-star hotels across India. They have been in the hospitality industry for the past 100 years. Due to strategic moves from other competitors and ineffective decision-making in management, Radisson is losing its market share and revenue in the luxury/business hotels category. As a strategic move, the managing director of Radisson wanted to incorporate Business and Data Intelligence in order to regain their market share and revenue. Our task is to create an analytics dashboard & story to provide them insights to make better business decisions.

Technical Architecture:



Project Flow

To accomplish this, we have to complete all the activities listed below,

- Define Problem / Problem Understanding
  - Specify the business problem
  - Business requirements
  - Literature Survey
  - Social or Business Impact.
- Data Collection & Extraction from Database
  - Collect the dataset,
  - Storing Data in DB
  - Perform SQL Operations
  - Connect DB with Tableau
- Data Preparation
  - Prepare the Data for Visualization
- Data Visualizations
  - No of Unique Visualizations
- Dashboard
  - Responsive and Design of Dashboard
- Story
  - No of Scenes of Story
- Performance Testing
  - Amount of Data Rendered to DB ‘
  - Utilization of Data Filters
  - No of Calculation Fields
  - No of Visualizations/ Graphs
- Web Integration
  - Dashboard and Story embed with UI With Flask
- Project Demonstration & Documentation
  - Record explanation Video for project end to end solution
  - Project Documentation-Step by step project development procedure

Data Collection & Extraction from Database

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes and generate insights from the data.

Activity 1: Collect the dataset

Please use the link to download the dataset: Link

Activity 1.1: Understand the data

Data contains all the meta information regarding the columns described in the CSV files. we have provided 5 CSV files:

1. dim_date
2. dim_hotels
3. dim_rooms
4. fact_aggregated_bookings
5. fact_bookings

Column Description for dim_date:

1. date: This column represents the dates present in May, June and July.
2. mmm yy: This column represents the date in the format of mmm yy (monthname year).
3. week no: This column represents the unique week number for that particular date.
4. day_type: This column represents whether the given day is Weekend or Weekday.

Column Description for dim_hotels:

1. property_id: This column represents the Unique ID for each of the hotels.
2. property_name: This column represents the name of each hotel.
3. category: This column determines which class[Luxury, Business] a particular hotel/property belongs to.
4. city: This column represents where the particular hotel/property resides in.

Column Description for dim_rooms:

1. room_id: This column represents the type of room[RT1, RT2, RT3, RT4] in a hotel.
2. room_class: This column represents to which class[Standard, Elite, Premium, Presidential] particular room type belongs.

Column Description for fact_aggregated_bookings:

1. property_id: This column represents the Unique ID for each of the hotels.

2. check_in_date: This column represents all the check_in_dates of the customers.

3. room_category: This column represents the type of room[RT1, RT2, RT3, RT4] in a hotel.

4. successful_bookings: This column represents all the successful room bookings that happen for a particular room type in that hotel on that particular date.

5. capacity: This column represents the maximum count of rooms available for a particular room type in that hotel on that particular date.

Column Description for fact_bookings:

1. booking_id: This column represents the Unique Booking ID for each customer when they booked their rooms.

2. property_id: This column represents the Unique ID for each of the hotels

3. booking_date: This column represents the date on which the customer booked their rooms.

4. check_in_date: This column represents the date on which the customer check-in(entered) at the hotel.

5. check_out_date: This column represents the date on which the customer check-out(left) of the hotel.

6. no_guests: This column represents the number of guests who stayed in a particular room in that hotel.

7. room_category: This column represents the type of room[RT1, RT2, RT3, RT4] in a hotel.

8. booking_platform: This column represents in which way the customer booked his room.

9. ratings_given: This column represents the ratings given by the customer for hotel services.

10. booking_status: This column represents whether the customer cancelled his booking[Cancelled], successfully stayed in the hotel[Checked Out] or booked his room but not stayed in the hotel[No show].

11. revenue_generated: This column represents the amount of money generated by the hotel from a particular customer.

12. revenue_realized: This column represents the final amount of money that goes to the hotel based on booking status. If the booking status is cancelled, then 40% of the revenue generated is deducted and the remaining is refunded to the customer. If the booking status is Checked Out/No show, then full revenue generated will go to hotels.

Activity 2: Storing Data in DB & Perform SQL Operations & Connect DB with Tableau

Let us connect the dataset in my SQL Workbench and we have to enter the executive programmes in My SQL Dashboard and we have the perform programmes and it gives OUTPUT of the programmes.

After Completing MY SQL workbench programmes the same dataset we connect my SQL to Tableau. We have to open the tableau.

- Now click on the to a Server of the tableau
- Click on the search button Now enter MY SQL
- Click on MY SQL Option
- It will ask username and password of MY SQL.
- It will connect the dataset of MYSQL, it's show in tableau.

Data Preparation

Prepare the Data for Visualization

Preparing the data for visualization involves cleaning the data to remove irrelevant or missing data, transforming the data into a format that can be easily visualized, exploring the data to identify patterns and trends, filtering the data to focus on specific subsets of data, preparing the data for visualization software, and ensuring the data is accurate and complete. This process helps to make the data easily understandable and ready for creating visualizations to gain insights into the performance and efficiency.

Data Visualization

Data visualization is the process of creating graphical representations of data in order to help people understand and explore the information. The goal of data visualization is to make to the complex data sets more accessible, intuitive, and easier to interpret. By using visual elements such as charts, graphs, and maps, data visualizations can help people quickly identify patterns, trends, and outliers in the data.

Activity 1: No of Unique Visualizations

The number of unique visualizations that can be created with a given dataset. Some common types of visualizations that can be used to analyze the performance and efficiency of Radisson Hotels include bar charts, line charts, heat maps, scatter plots, pie charts,Maps etc. These visualizations can be used to compare performance, track changes over time, show distribution, and relationships between variables, breakdown of revenue and customer demographics, workload, resource allocation and location of hotels.

Activity 1.1: Revenue split by city

Activity 1.2: Occupancy split by city

Activity 1.3: Occupancy by day type

Activity 1.4: Revenue by room class

Activity 1.5: Booking % by platform

Activity 1.6: Property By key metrics

Activity 1.7: Revenue contribution % by category

Activity 1.8: Successful Bookings by city

Activity 1.9: Successful Booking by date wise

Activity 1.10: Total Revenue for the hotels

Activity 1.11: Total Successful Bookings

Activity 1.12: Occupancy in %

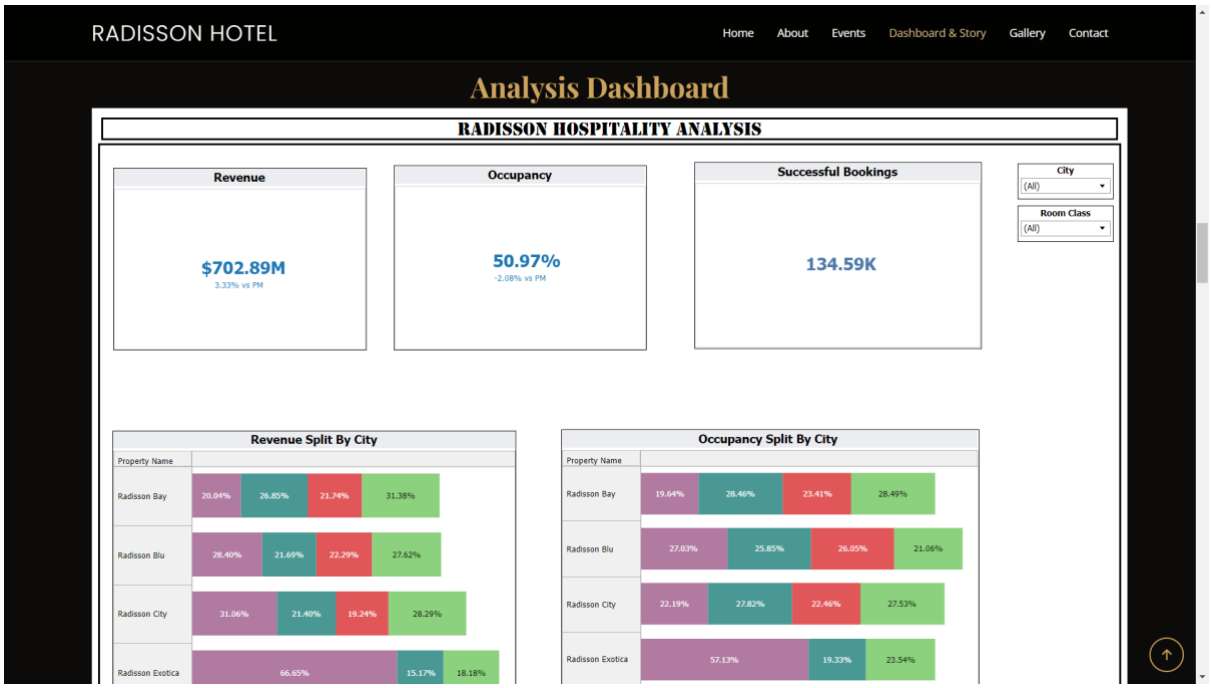
Dashboard

A dashboard is a graphical user interface (GUI) that displays information and data in an organized, easy-to-read format. Dashboards are often used to provide real-time monitoring and analysis of data, and are typically designed for a specific purpose or use case. Dashboards can be used in a variety of settings, such as business, finance, manufacturing, healthcare, and many other industries. They can be used to track key performance indicators (KPIs), monitor performance metrics, and display data in the form of charts, graphs, and tables.

Activity :1- Responsive and Design of Dashboard

The responsiveness and design of a dashboard for analyzing the performance and efficiency of Radisson Hotels is crucial to ensure that the information is easily understandable and actionable. Key considerations for designing a responsive and effective dashboard include user-centered design, clear and concise information, interactivity, data-driven approach, accessibility, customization, and security. The goal is to create a dashboard that is user-friendly, interactive, and data-driven, providing actionable insights to improve the performance and efficiency of Radisson Hotels.

Once you have created views on different sheets in Tableau, you can pull them into a dashboard.

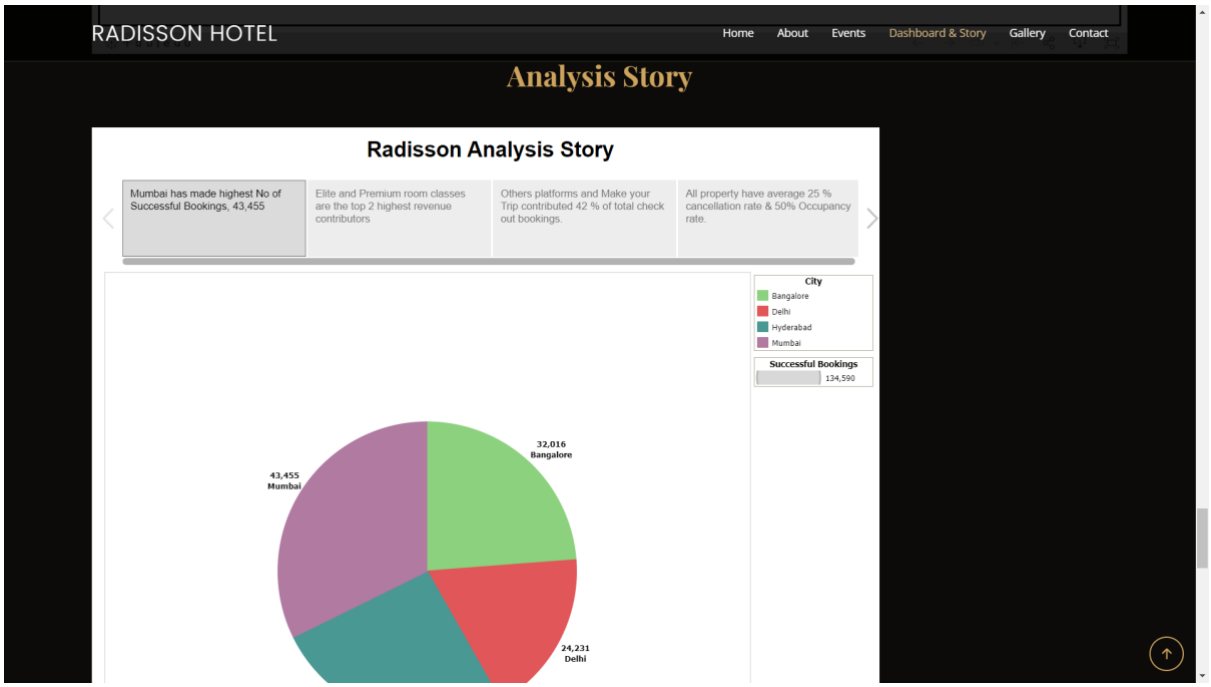


Story

A data story is a way of presenting data and analysis in a narrative format, with the goal of making the information more engaging and easier to understand. A data story typically includes a clear introduction that sets the stage and explains the context for the data, a body that presents the data and analysis in a logical and systematic way, and a conclusion that summarizes the key findings and highlights their implications. Data stories can be told using a variety of mediums, such as reports, presentations, interactive visualizations, and videos.

No of Scenes of Story

The number of scenes in a storyboard for a data visualization analysis of the performance and efficiency of Radisson Hotels will depend on the complexity of the analysis and the specific insights that are trying to be conveyed. A storyboard is a visual representation of the data analysis process and it breaks down the analysis into a series of steps or scenes.

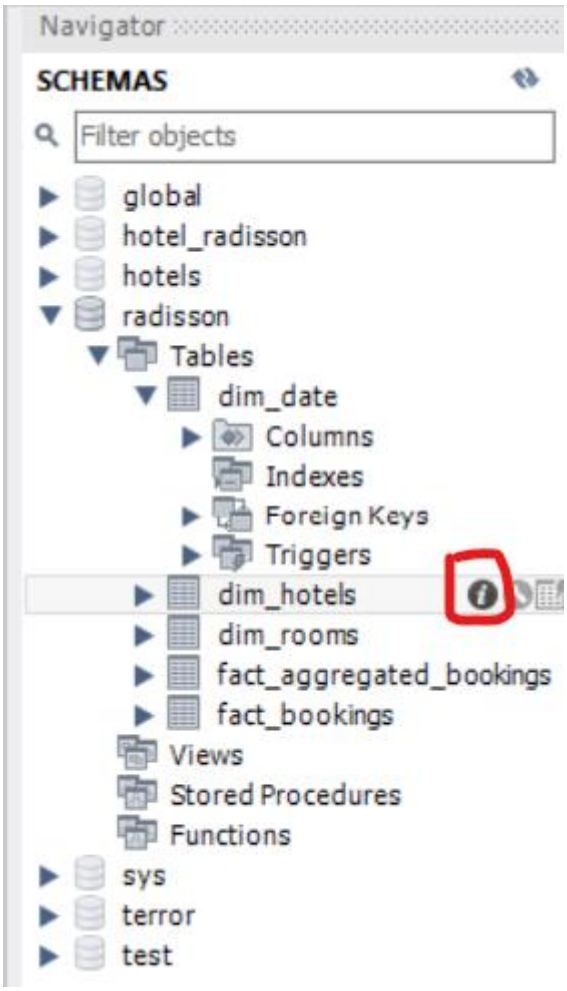


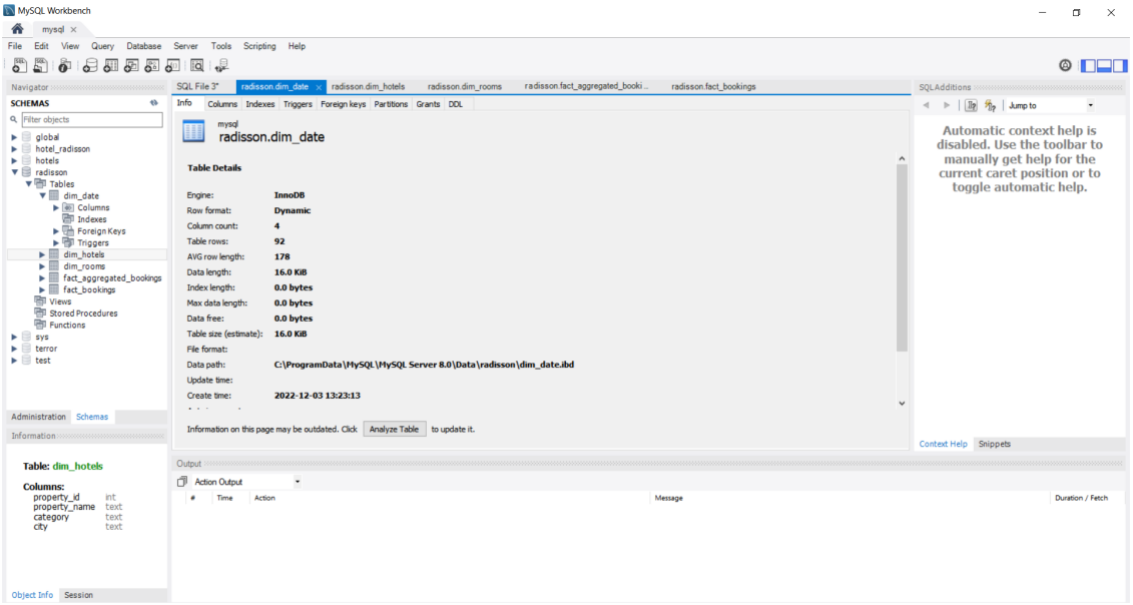
Performance Testing

Activity 1: Amount of Data Rendered to DB

- The amount of data that is rendered to a database depends on the size of the dataset and the capacity of the database to store and retrieve data.

- Open the MySQL Workbench, go to the database then click to expand the tables,select the table and click on (i) button to get the information related to table such as column count,table rows etc.




MySQL Workbench
mysql
File Edit View Query Database Server Tools Scripting Help
Navigator
SCHEMAS
Filter objects
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hotel_radisson
hotels
radisson
Tables
dim_date
Columns
Indexes
Foreign Keys
Triggers
dim_hotels
dim_rooms
fact_aggregated_bookings
fact_bookings
Views
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Administration Schemas
Information
Table: dim_hotels
Columns:
property_id int
property_name text
category text
city text
Object Info Session
SQL File 3*
radisson.dim_date
radisson.dim_hotels
radisson.dim_rooms
radisson.fact_aggregated_booki ..
radisson.fact_bookings
Info Columns Indexes Triggers Foreign keys Partitions Grants DDL
mysql
radisson.dim_date
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Row format: Dynamic
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SQLAdditions
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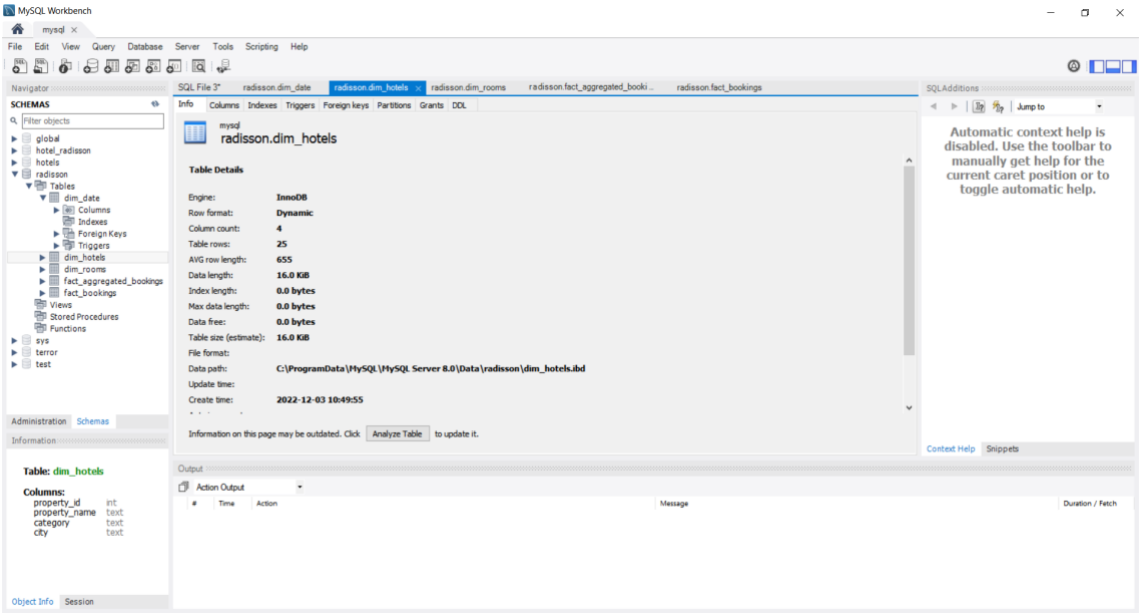
Context Help Snippets
Output
Action Output
Time Action Message Duration / Fetch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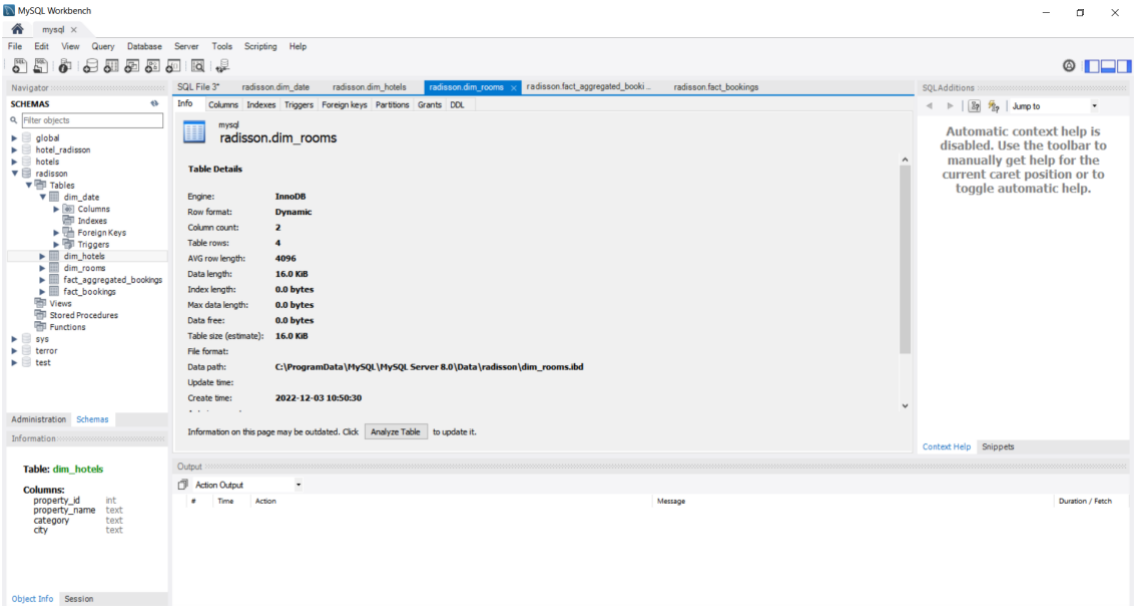
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city text
Object Info Session
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Info Columns Indexes Triggers Foreign keys Partitions Grants DDL
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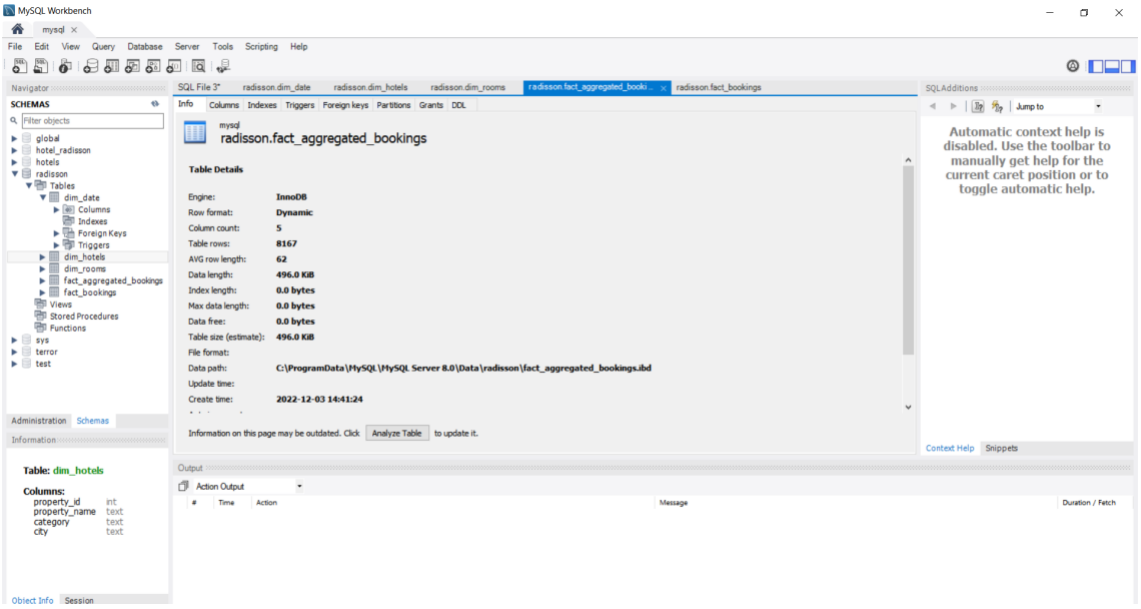
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mysql
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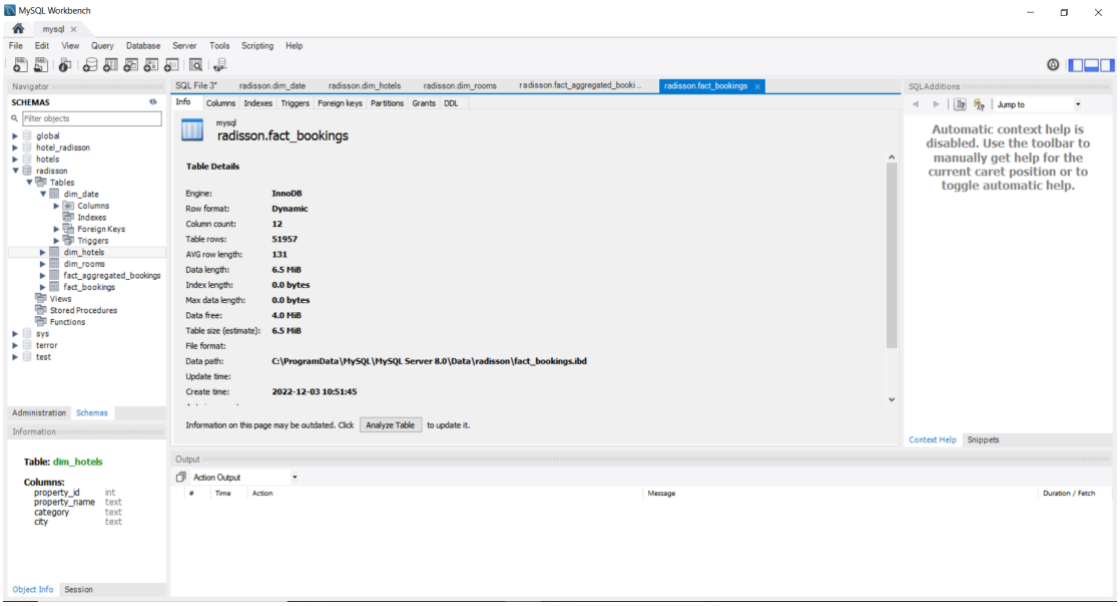
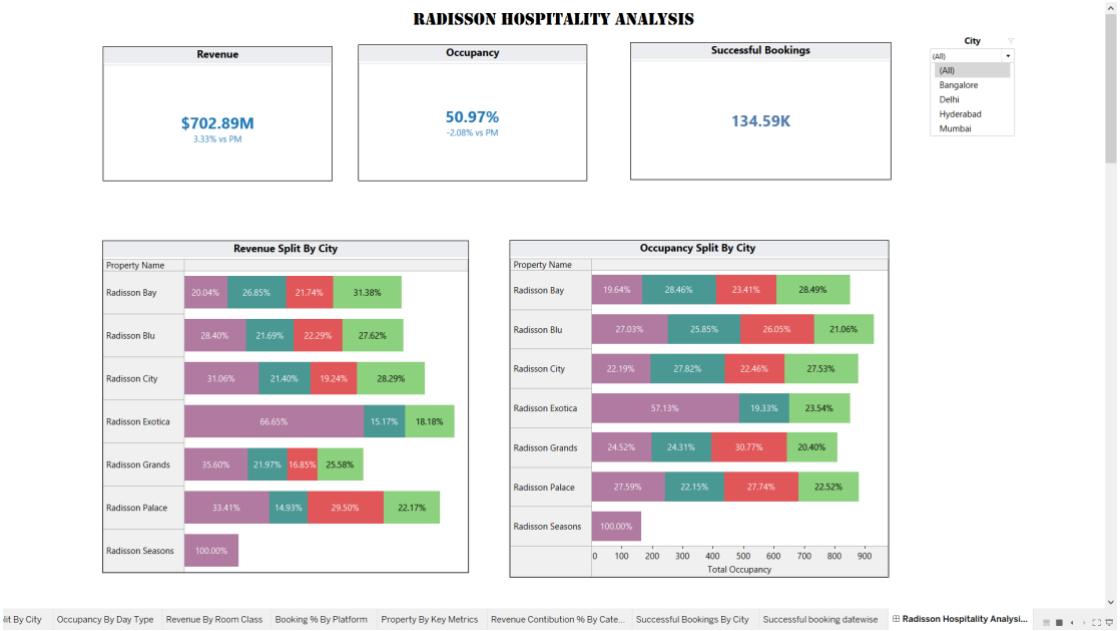
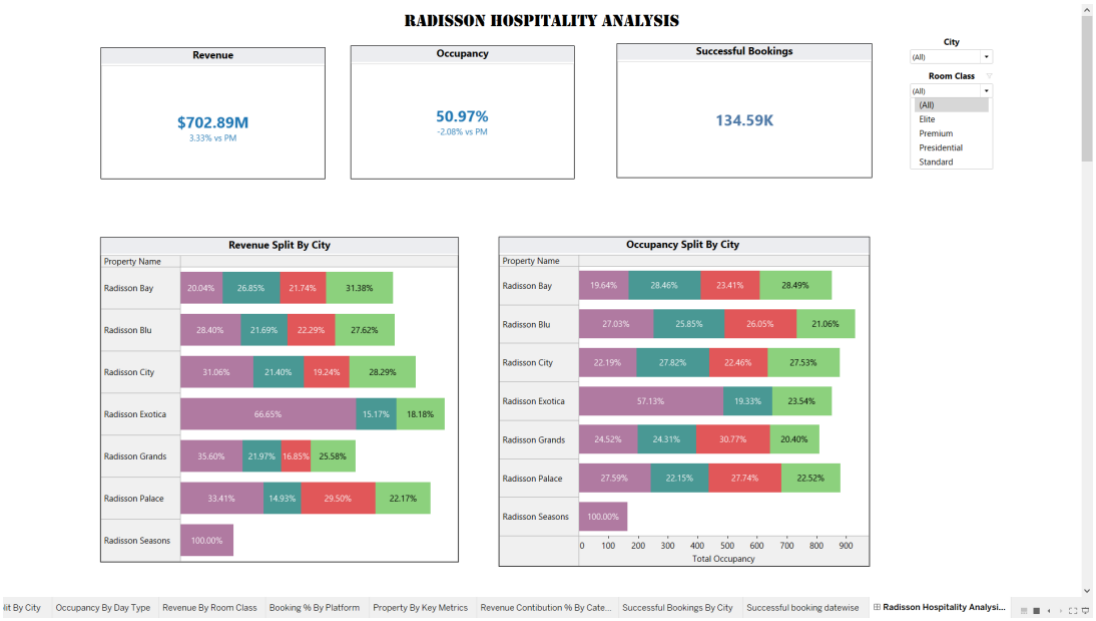


Activity 2: Utilization of Data Filters





Activity 3: No of Calculation Fields

Tables

Abc	*Measure Names*
=Abc	% Occupancy change co...
=#	% Occupancy Change p...
=#	% rating Change
=Abc	% Revenue Change Color
=#	% Revenue Change per ...
=#	% Revenue Change per ...
=#	Cancelled booking no.
=#	Cancelled bookings %
=#	Current Month Revenue
=#	Occupancy - Current Mo...
=#	Occupancy %
=#	Occupancy Change per ...
=#	Occupancy Previous Mo...
=#	Previous Month Revenue
=Abc	Rating
=Abc	rating change color
=#	Rating Current Month
=#	Ratings Change
=#	ratings given replace val...
=#	ratings given replace val...
=#	Ratings Previous Month
=#	ratings round
=#	Revenue
=#	Revenue Change per Mo...
=#	Total Occupancy

Activity 4: No of Visualizations/ Graphs

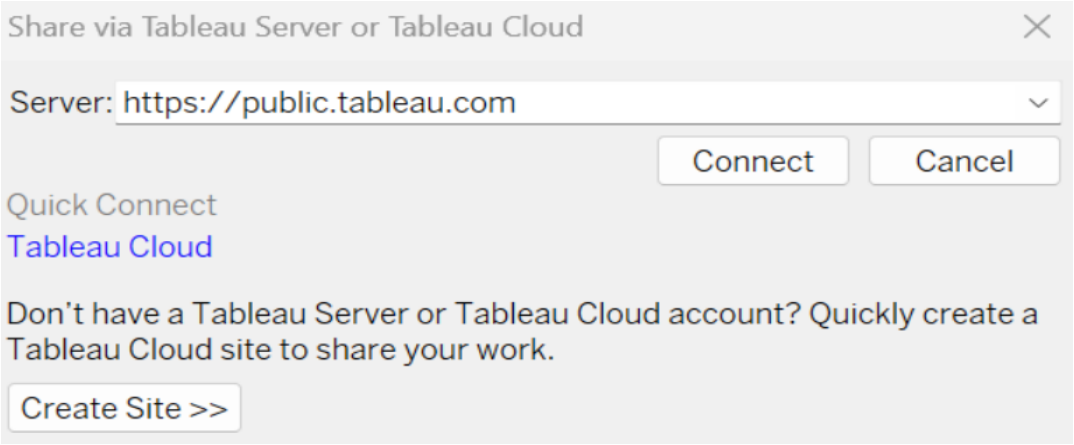
1. Revenue split by city
2. Occupancy split by city
3. Occupancy by day type
4. Revenue by room class
5. Booking % by platform
6. Property By key metrics
7. Revenue contribution % by category
8. Successful Bookings by city
9. Successful Booking by date wise
10. Total Revenue for the hotels
11. Total Successful Bookings
12. Occupancy in %

Web integration

Publishing helps us to track and monitor key performance metrics, to communicate results and progress. help a publisher stay informed, make better decisions, and communicate their performance to others.

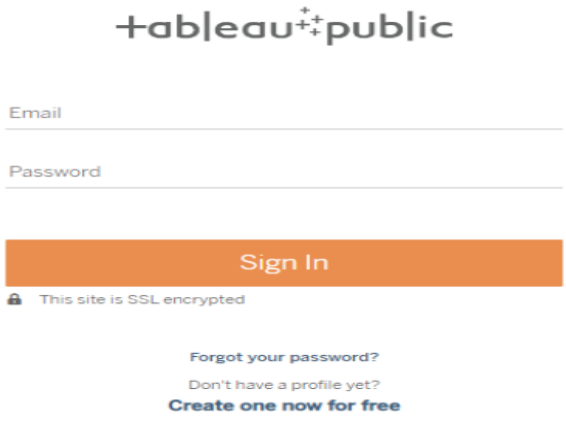
Publishing dashboard and reports to tableau public

Step 1: Go to Dashboard/story, click on share button on the top ribbon



Give the server address of your tableau public account and click on connect.

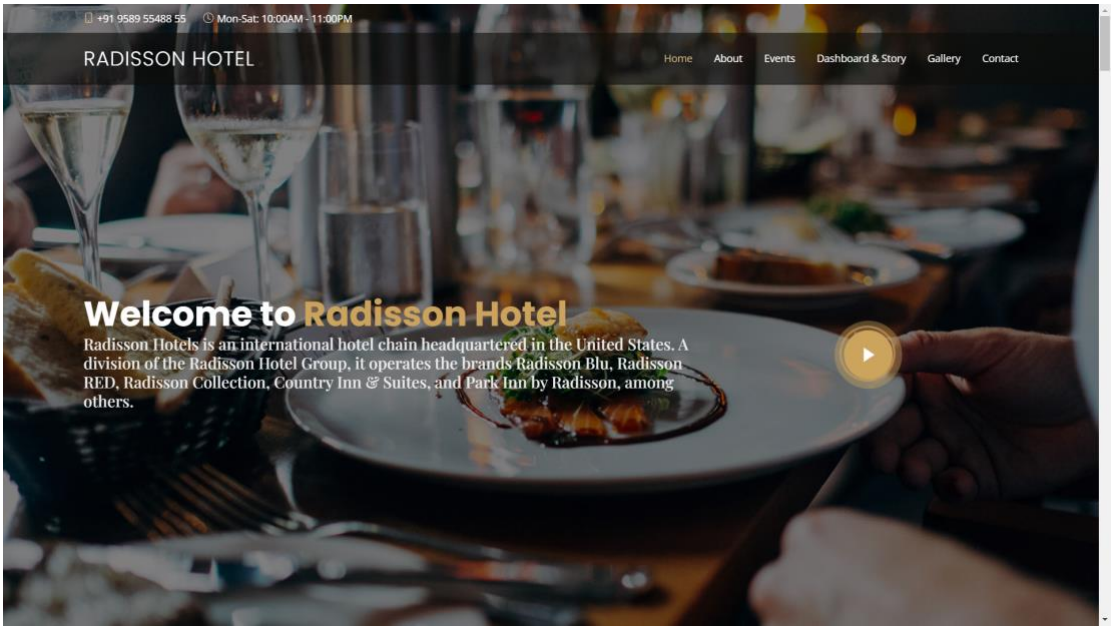
Step 2: Once you click on connect it will ask you for tableau public user name and password

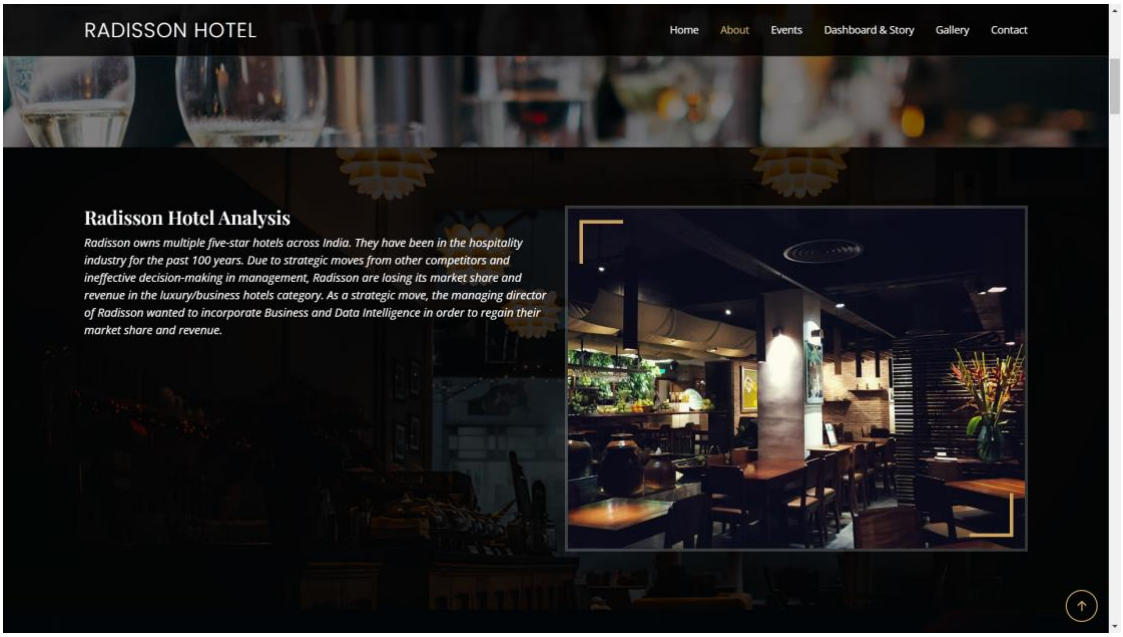


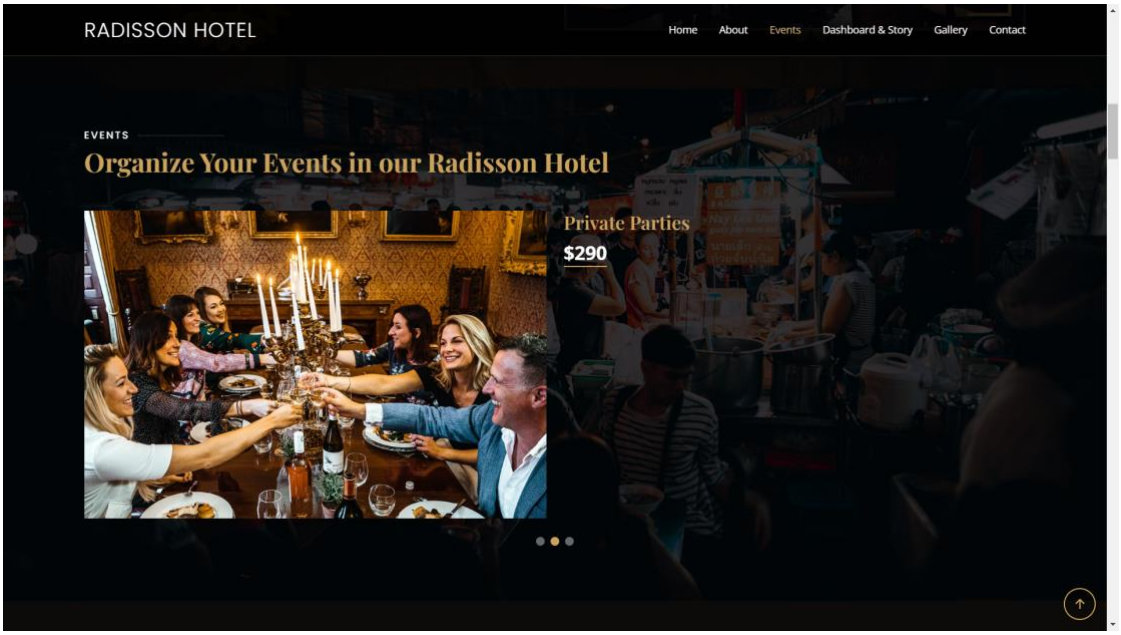
Once you login into your tableau public using the credentials, the particular visualization will be published into tableau public

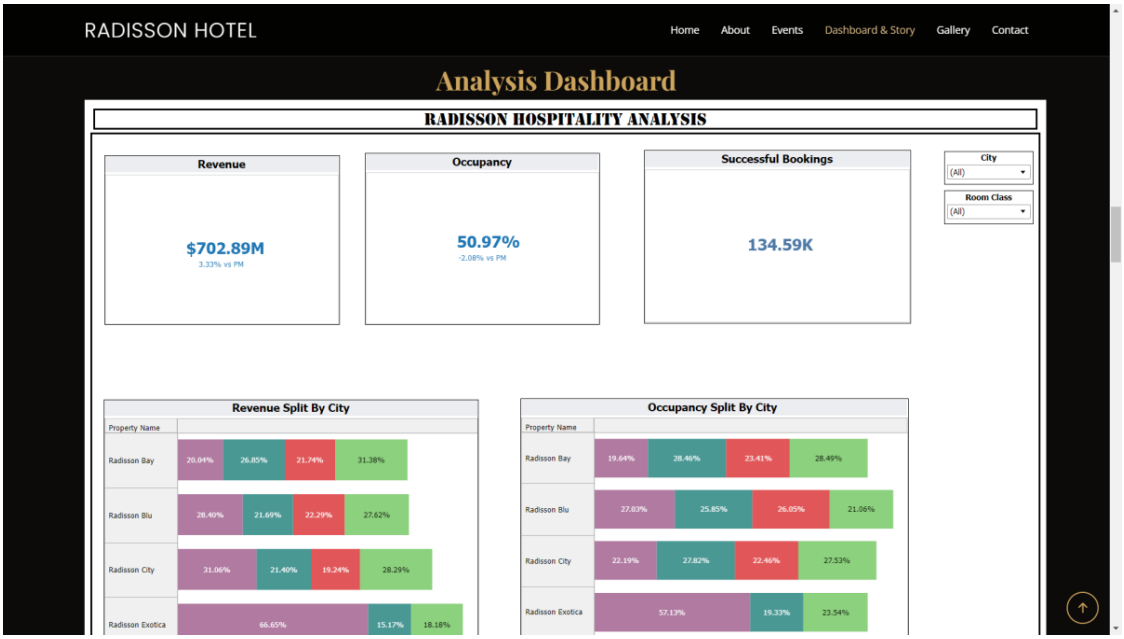
Note: While publishing the visualization to the public, the respective sheet will get published when you click on share option.

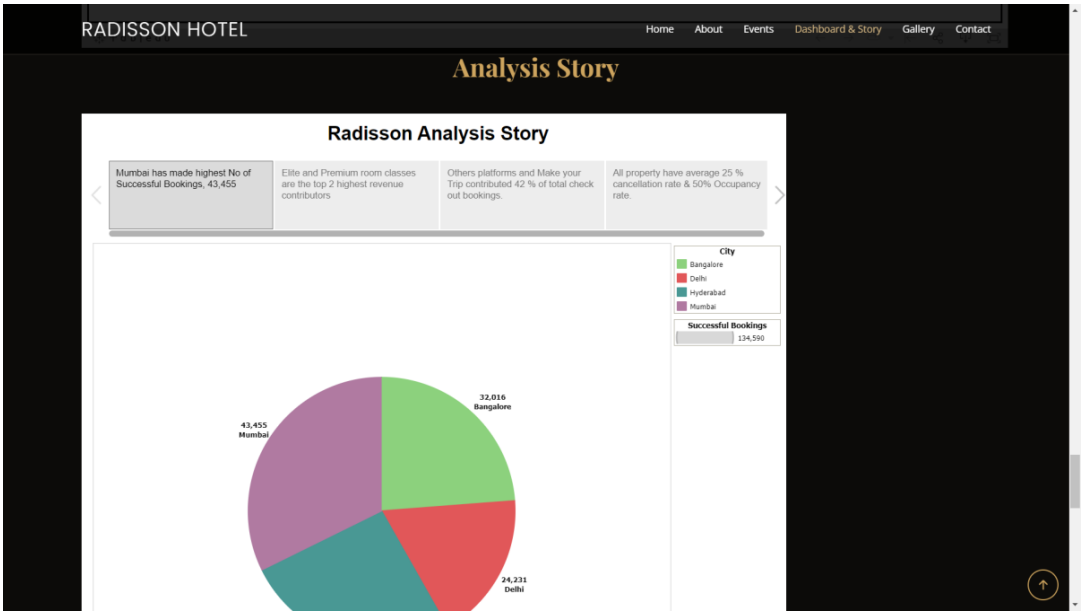
Activity 1: Dashboard and Story embed with UI With Flask

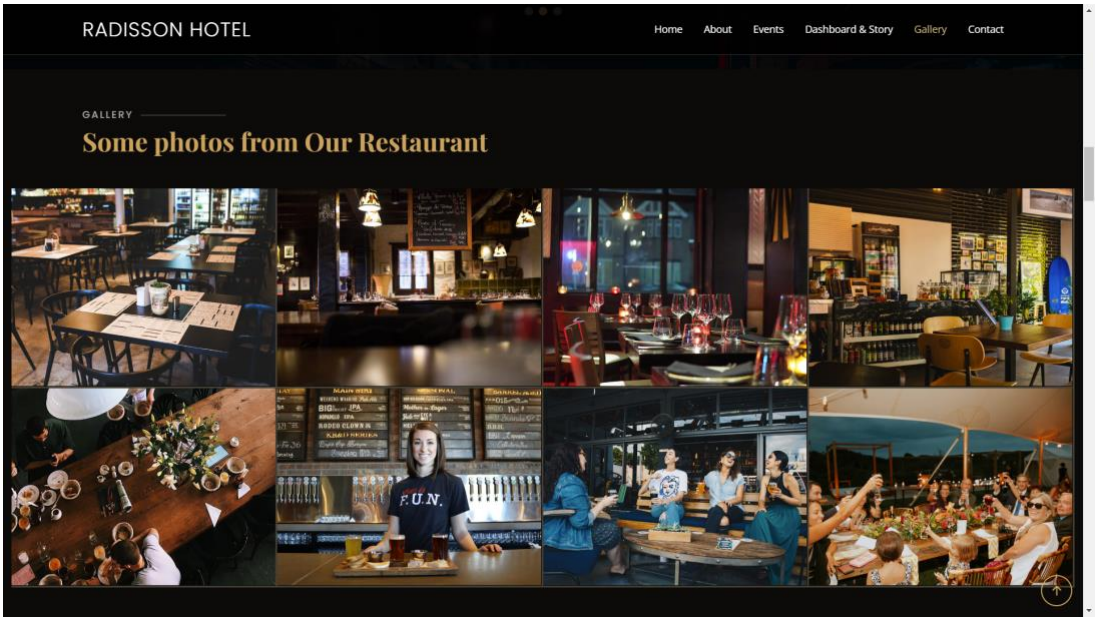


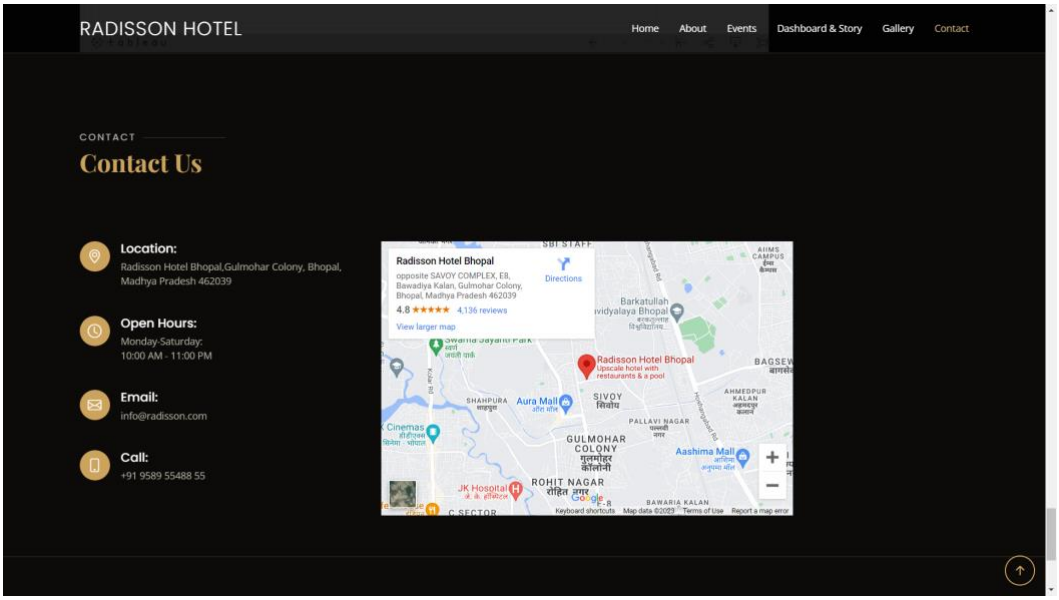


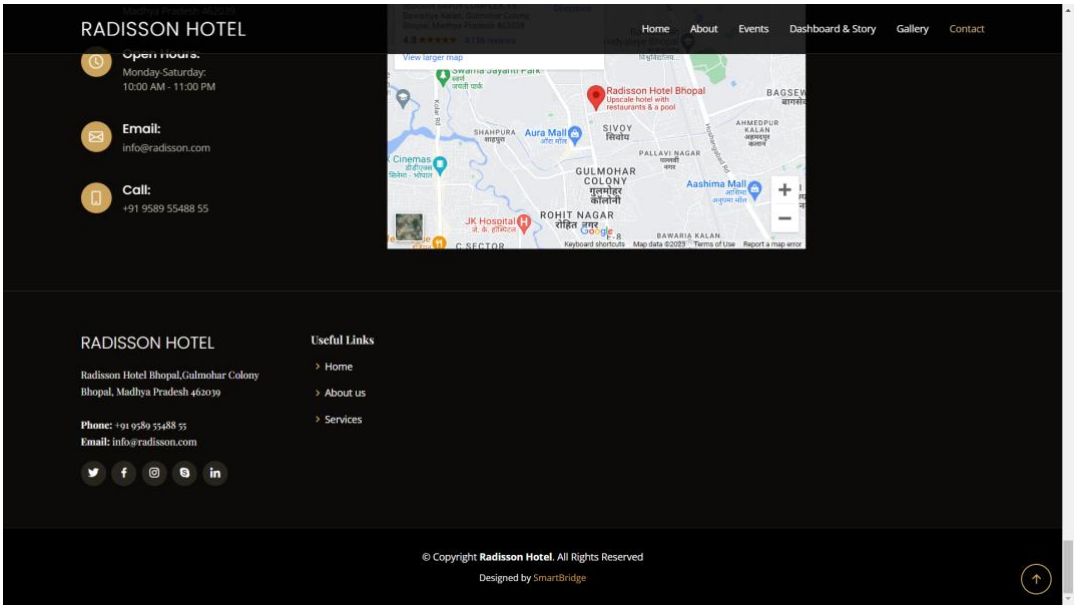

RADISSON HOTEL
Home
About
Events
Dashboard & Story
Gallery
Contact
EVENTS
Organize Your Events in our Radisson Hotel
Private Parties
$290


RADISSON HOTEL
Home
About
Events
Dashboard & Story
Gallery
Contact
Analysis Dashboard
RADISSON HOSPITALITY ANALYSIS
Revenue
$702.89M
3.33% vs PM
Occupancy
50.97%
-2.08% vs PM
Successful Bookings
134.59K
City
(All)
Room Class
(All)
Revenue Split By City
Property Name
Radisson Bay
20.04%
26.85%
21.74%
31.38%
Radisson Blu
28.40%
21.69%
22.29%
27.62%
Radisson City
31.06%
21.40%
19.24%
28.29%
Radisson Exotica
66.65%
15.17%
18.18%
Occupancy Split By City
Property Name
Radisson Bay
19.64%
28.46%
23.41%
28.49%
Radisson Blu
27.03%
25.85%
26.05%
21.06%
Radisson City
22.19%
27.82%
22.46%
27.53%
Radisson Exotica
57.13%
19.33%
23.54%


RADISSON HOTEL
Home
About
Events
Dashboard & Story
Gallery
Contact
Analysis Story
Radisson Analysis Story
Mumbai has made highest No of Successful Bookings, 43,455
Elite and Premium room classes are the top 2 highest revenue contributors
Others platforms and Make your Trip contributed 42 % of total check out bookings.
All property have average 25 % cancellation rate & 50% Occupancy rate.
City
Bangalore
Delhi
Hyderabad
Mumbai
Successful Bookings
134,590
32,016
Bangalore
43,455
Mumbai
24,231
Delhi


RADISSON HOTEL
Home
About
Events
Dashboard & Story
Gallery
Contact
GALLERY
Some photos from Our Restaurant
F.U.N.





Milestone 9: Project Demonstration & Documentation

Below mentioned deliverables to be submitted along with other deliverables

Activity 1:- Record explanation Video for project end to end solution

Activity 2:- Project Documentation-Step by step project development procedure

Create document as per the template provided