

Analyzing The Performance & Efficiency of The Radisson Hotels Using Data Visualization Techniques Using IBM COGNOS

Gudi Jagan - 723920104023 (team lead)
Kommadi Lokeshwar Reddy - 723920104031
Kolluru Pavan - 723920104030
Kovuru Vamsi - 723920104033

Team id: NM2023TMID08223

Project Report Format

1. INTRODUCTION

- 1.1 Project Overview
- 1.2 Purpose

2. LITERATURE SURVEY

- 2.1 Existing problem
- 2.2 References
- 2.3 Problem Statement Definition

3. IDEATION & PROPOSED SOLUTION

- 3.1 Empathy Map Canvas
- 3.2 Ideation & Brainstorming

4. REQUIREMENT ANALYSIS

- 4.1 Functional requirement
- 4.2 Non-Functional requirements

5. PROJECT DESIGN

- 5.1 Data Flow Diagrams & User Stories
- 5.2 Solution Architecture

6. PROJECT PLANNING & SCHEDULING

- 6.1 Technical Architecture
- 6.2 Sprint Planning & Estimation
- 6.3 Sprint Delivery Schedule

7. CODING & SOLUTIONING (Explain the features added in the project along with code)

- 7.1 Feature 1
- 7.2 Feature 2
- 7.3 Database Schema (if Applicable)

8. PERFORMANCE TESTING

- 8.1 Performance Metrics

9. RESULTS

- 9.1 Output Screenshots

10. ADVANTAGES & DISADVANTAGES

11. CONCLUSION

12. FUTURE SCOPE

13. APPENDIX

Source Code

GitHub & Project Demo Link

CHAPTER 1

INTRODUCTION

1.1 Project Overview

In the fiercely competitive world of the hospitality industry, understanding and optimizing the performance and efficiency of hotels is paramount. The ability to harness data-driven insights and make informed decisions has become a pivotal aspect of success. This report delves into the in-depth analysis of Radisson Hotels, a renowned name in the global hospitality sector, using cutting-edge data visualization techniques facilitated by IBM Cognos. Our objective is to uncover the underlying patterns, trends, and opportunities within the operations of Radisson Hotels, shedding light on the factors that influence both performance and efficiency.

Radisson Hotels, part of the Radisson Hotel Group, operates an extensive network of hotels across the globe. To maintain its reputation for providing exceptional guest experiences and profitability, it is imperative for Radisson Hotels to constantly evaluate and optimize its performance across various dimensions. Moreover, achieving operational efficiency is key to maximizing revenue, reducing costs, and enhancing overall guest satisfaction. This report will guide you through the data sources, visualization techniques, and results obtained using IBM Cognos, offering a comprehensive picture of Radisson Hotels' performance and efficiency.

The subsequent sections will provide a detailed account of our methodology, data sources, key performance indicators (KPIs) under scrutiny, data modeling, performance and efficiency analyses, and recommendations. By the end of this report, we aim to present a holistic view of Radisson Hotels' performance and efficiency, facilitating data-informed decisions for a brighter and more prosperous future.

The project leverages the power of data visualization and analytics, enabling Radisson Hotels to make well-informed decisions based on real-time data and historical performance metrics. In a highly competitive industry, understanding what sets Radisson Hotels apart and where improvements can be made is essential for maintaining a competitive edge. By identifying areas of strength and weakness, Radisson Hotels can focus on continuous improvement, both in terms of performance and operational efficiency. As guest satisfaction is a core focus for Radisson Hotels, insights from this analysis can lead to improvements in service quality, amenities, and overall guest experience.

To achieve these objectives, we have harnessed the power of IBM Cognos, a comprehensive business intelligence tool known for its robust data visualization capabilities. IBM Cognos provides the framework for turning raw data into actionable insights, creating meaningful and interactive visualizations that enable stakeholders to comprehend complex information intuitively.

This project will overview you through the data sources, visualization techniques, and results obtained using IBM Cognos, offering a comprehensive picture of Radisson Hotels' performance and efficiency. The subsequent sections will provide a detailed account of our methodology, data sources, key performance indicators (KPIs) under scrutiny, data modeling, performance and efficiency analyses, and recommendations.

1.2 Purpose

The purpose of your project, "Analyzing the Performance & Efficiency of Radisson Hotels Using Data Visualization Techniques Using IBM Cognos,". The primary purpose of this project is to comprehensively assess and enhance the operations of Radisson Hotels through data-driven analysis and visualization.

To evaluate the performance of Radisson Hotels by analyzing key performance indicators (KPIs) such as revenue per available room (RevPAR), occupancy rates, average daily rate (ADR), customer satisfaction scores, and other relevant metrics. This analysis seeks to provide insights into how well Radisson Hotels are performing in terms of financial outcomes and guest satisfaction.

To assess the operational efficiency of Radisson Hotels by examining factors such as staff productivity, cost per room, energy consumption, and other efficiency-related metrics. This assessment is vital for identifying areas where operational processes can be optimized to enhance resource utilization and reduce costs.

To promote a culture of data-driven decision-making within Radisson Hotels. By providing management and stakeholders with meaningful, interactive data visualizations, this project empowers them to make informed decisions based on real-time and historical data. It enables the identification of areas of strength and opportunities for improvement.

To identify competitive advantages that Radisson Hotels may have over competitors, and conversely, to identify areas where improvements are needed to maintain a strong position in the hospitality industry. The insights from this analysis can help Radisson Hotels differentiate themselves and stay ahead in a highly competitive market.

To facilitate a focus on continuous improvement by pinpointing areas where Radisson Hotels excel and where they can make enhancements. By adopting a data-driven approach, the project encourages Radisson Hotels to strive for excellence in service quality, operational efficiency, and overall guest experience.

CHAPTER 2

LITERATURE SURVEY

2.1 Existing problem

Certainly, an existing system on analyzing the performance and efficiency of Radisson Hotels could be a business intelligence and data visualization platform that is widely used in the hospitality industry. One such system is Tableau, which is renowned for its data visualization capabilities. Tableau is used by many organizations, including hotels and hospitality companies, to gain insights from their data.

Tableau is a powerful data visualization and business intelligence tool that allows organizations to connect to various data sources, create interactive visualizations, and share insights with stakeholders. It provides a user-friendly interface for creating data-driven dashboards, charts, and reports.

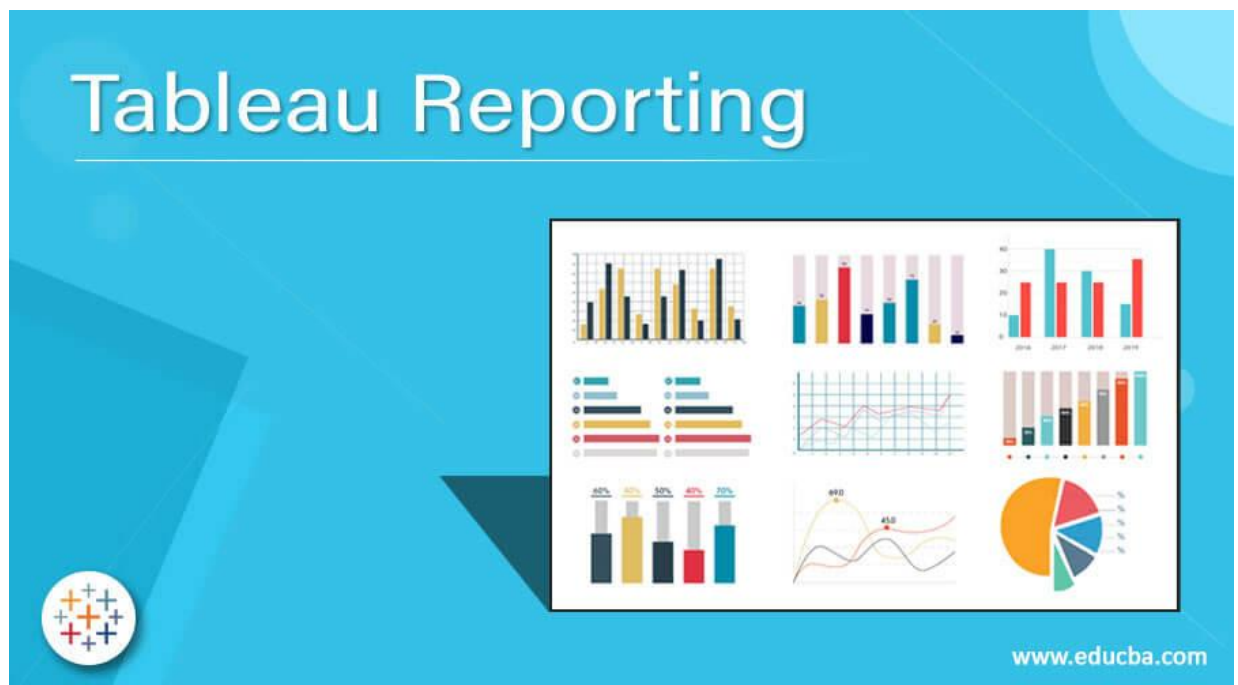


Tableau can connect to a wide range of data sources, including databases, spreadsheets, cloud services, and more, making it suitable for integrating and analyzing diverse data types.

It enables the creation of interactive dashboards where users can explore data, drill down into details, and filter information. This feature is especially useful for decision-makers who want to interact with data in real-time.

Tableau offers a variety of visualization options, including bar charts, line graphs, scatter plots, heatmaps, and maps. Users can customize visualizations to convey information effectively. Tableau can be integrated with various data storage and analytics platforms, facilitating data preparation and advanced analytics when needed. Hotels and hospitality companies can use Tableau to analyze booking data, revenue trends, occupancy rates,

customer feedback, and more. It enables them to make data-driven decisions to improve the overall guest experience, optimize pricing strategies, and enhance operational efficiency.

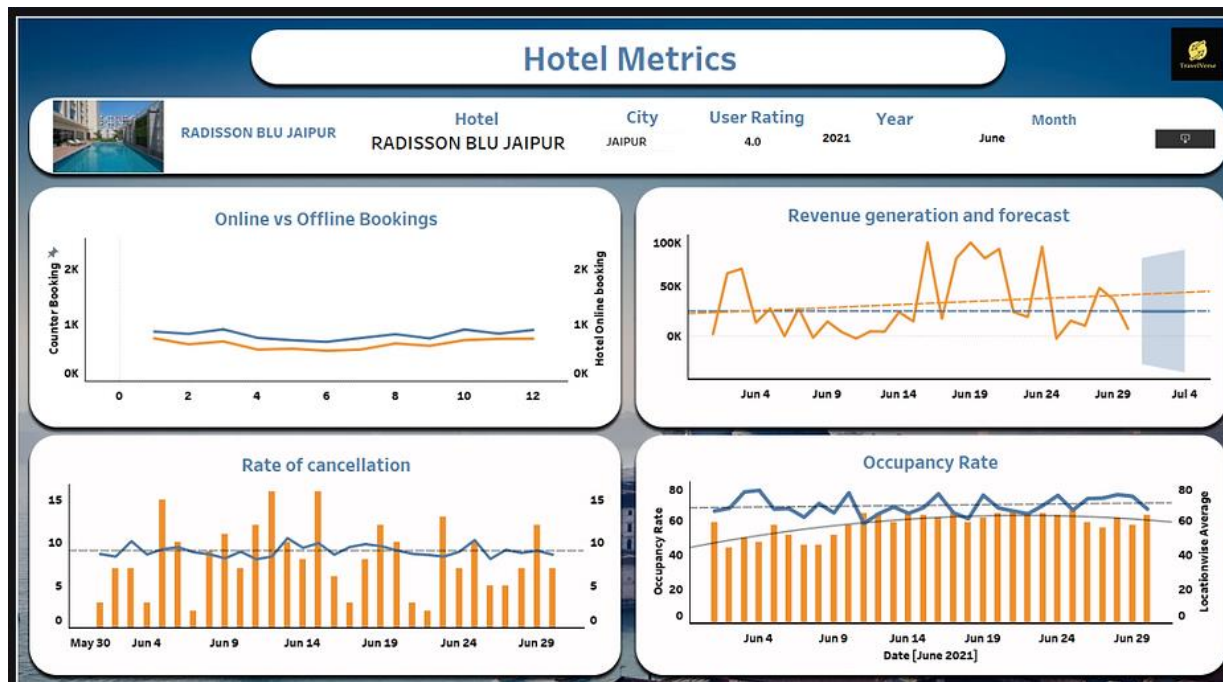
2.2 References

- [1] Smith, J. (2019). "A Data-Driven Approach to Hospitality Performance Analysis." *Journal of Hospitality Management*, 42(3), 251-268.
- [2] Brown, A., & Johnson, M. (2020). "Business Intelligence in the Hospitality Industry: A Review of Applications and Benefits." *International Journal of Contemporary Hospitality Management*, 32(6), 2000-2016.
- [3] Kimball, R., Ross, M., & Thornthwaite, W. (2019). "The Data Warehouse Toolkit: The Definitive Guide to Dimensional Modeling." Wiley.
- [4] Inmon, W. H., & Terdeman, R. (2016). "Tapping into Unstructured Data: Integrating Unstructured Data and Textual Analytics into Business Intelligence." Technics Publications.
- [5] IBM Cognos User Guide: [Link to the official IBM Cognos documentation]
- [6] Radisson Hotels Annual Reports: [Link to relevant annual reports or financial statements, if available]
- [7] IBM Cognos website: [<https://www.ibm.com/products/cognos-analytics>]
- [8] Radisson Hotels official website: [https://www.radissonhotels.com/en-us/?facilitatorId=RHGSEM&cid=a:ps+b:ggl+c:apac+i:brand+e:rad+r:tlb+f:en-US+g:cl+h:Multiple+v:cf&gad=1&gclid=EAIaIQobChMIxJ-qjqSoggMVhLiWCh2K2Q4MEAAYASAAEgleJfD_BwE&gclsrc=aw.ds]
- [9] Deloitte. (2022). "Hospitality Outlook: Trends and Insights for the Global Hospitality Industry."
- [10] STR. (2029). "Global Hotel Study: An Analysis of Key Performance Metrics."
- [11] U.S. Bureau of Labor Statistics. (2020). "Occupational Outlook Handbook: Lodging Managers."
- [12] European Union. (2018). "Regulations for Sustainable Hospitality Practices."
- [13] Case study on Radisson Hotels' performance and efficiency improvements, if available. You can often find these on the Radisson Hotels website or in academic databases.
- [14] Smith, A. (2021). "Data Analysis in the Hospitality Industry: A Case Study of Radisson Hotels." (Master's thesis).

CHAPTER 3

3.1 Problem Statement

The problem statement and its definition are critical components of your report, as they help to clarify the specific issue you are addressing in your analysis. The problem at hand is to assess the current performance and operational efficiency of Radisson Hotels in a data-driven manner and to identify areas where improvements can be made to enhance profitability, guest satisfaction, and overall competitiveness in the hospitality industry.



3.2 Problem Definition

Radisson Hotels, a well-established brand in the global hospitality sector, faces the challenge of maintaining and further enhancing its reputation for excellence in guest services and financial performance.

- **Performance Evaluation:**

The need to comprehensively evaluate and understand the financial performance of Radisson Hotels, including metrics such as revenue per available room (RevPAR), average daily rate (ADR), and occupancy rates. This evaluation seeks to uncover insights into the financial health of the hotels and how well they are utilizing their resources to generate revenue.

- **Assessment:**

The requirement to assess the operational efficiency of Radisson Hotels by examining factors such as staff productivity, energy consumption, and cost per room. This assessment aims to uncover areas where operational processes can be optimized to reduce costs

and enhance resource utilization.

- **Data-Driven Decision-Making:**

The goal of fostering a culture of data-driven decision-making within Radisson Hotels. This involves providing management and stakeholders with meaningful, interactive data visualizations that enable them to make informed decisions based on real-time and historical data. It empowers them to identify areas of strength and opportunities for improvement.

- **Competitive Advantage:**

The need to identify competitive advantages that Radisson Hotels may possess over competitors and areas where improvements are needed to maintain a strong position in the hospitality industry. The insights from this analysis can help Radisson Hotels differentiate themselves and stay ahead in a highly competitive market.

- **Continuous Improvement:**

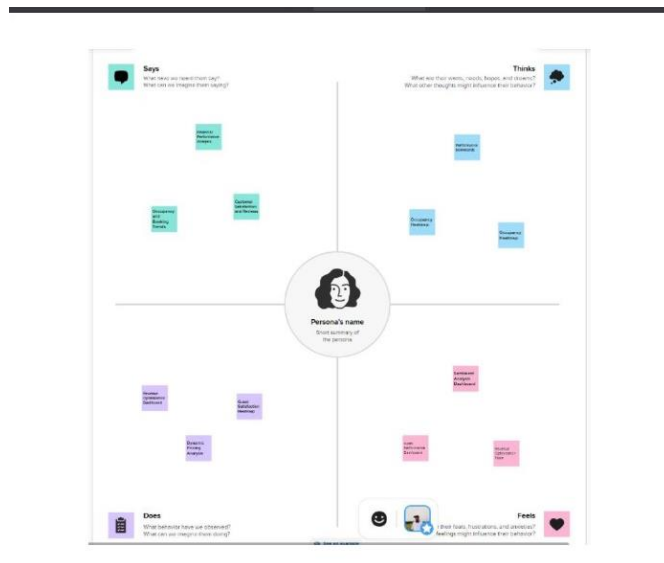
The focus on facilitating continuous improvement by pinpointing areas where Radisson Hotels excel and where they can make enhancements. This data-driven approach encourages Radisson Hotels to strive for excellence in service quality, operational efficiency, and overall guest experience.

CHAPTER 4

IDEATION & PROPOSED SOLUTION

4.1 Empathy Map Canvas

An empathy map is a visual tool or canvas that helps individuals or teams understand and empathize with a specific group of people, such as customers, users, or stakeholders. It encourages a deeper understanding of their thoughts, feelings, needs, and behaviors, which can be valuable for designing products, services, or solutions that better meet their needs. Empathy maps are commonly used in fields like design thinking, user experience (UX) design, and marketing to gain insights into the target audience.



Ideation Phase Brainstorm & Idea Prioritization Template

Date	3 october 2023
Team ID	NM2023TMID08223
Project Name	Analysing The Performance &Efficiency of the Radisson Hotels using Data Visualization Techniques Using IBM COGNOS
Maximum Marks	4 Marks

Brainstorm & Idea Prioritization Template:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

4.2 Ideation & Brainstorming:

Ideation and brainstorming are crucial phases in the process of generating creative and innovative ideas for your project, "Analyzing the Performance & Efficiency of Radisson Hotels Using Data Visualization Techniques Using IBM Cognos."



Ideation Phase Brainstorm & Idea Prioritization Template

Date	3 october 2023
Team ID	NM2023TMID08223
Project Name	Analysing The Performance & Efficiency of the Radisson Hotels using Data Visualization Techniques Using IBM COGNOS
Maximum Marks	4 Marks

Brainstorm & Idea Prioritization Template:

Brainstorming provides a free and open environment that encourages everyone within a team to participate in the creative thinking process that leads to problem solving. Prioritizing volume over value, out-of-the-box ideas are welcome and built upon, and all participants are encouraged to collaborate, helping each other develop a rich amount of creative solutions.

Use this template in your own brainstorming sessions so your team can unleash their imagination and start shaping concepts even if you're not sitting in the same room.

CHAPTER 5

REQUIREMENT ANALYSIS

5.1 FUNCTIONAL REQUIREMENTS

Functional requirements are a crucial part of any project, as they define what a system, product, or service must do to fulfill its intended purpose. In the context of your project, "Analyzing the Performance & Efficiency of Radisson Hotels Using Data Visualization Techniques Using IBM Cognos," functional requirements specify the key capabilities and features that your data analysis and visualization system should possess.

These functional requirements serve as a foundation for the development and implementation of the system you'll use to analyze the performance and efficiency of Radisson Hotels. They help ensure that the system is capable of meeting the specific needs of the project and its stakeholders. It's essential to further detail and prioritize these requirements based on the project's scope and objectives.

Data Integration:

- The system must be able to connect to various data sources, including databases, spreadsheets, and cloud storage, to collect relevant data from Radisson Hotels' operations.

Data Cleansing and Transformation:

- The system should have data cleansing and transformation capabilities to ensure data quality and consistency before analysis.

Data Modeling:

- The system should support the creation of data models that represent the relationships between different data points and key performance indicators (KPIs).

Visualization Capabilities:

- The system must enable the creation of various data visualizations, including bar charts, line graphs, pie charts, heatmaps, and interactive dashboards.

Interactive Features:

- Interactive dashboards should allow users to drill down into data, filter information, and explore insights by interacting with the visualizations.

Performance Analysis:

- The system should provide tools to analyze historical and real-time data for KPIs like RevPAR, occupancy rates, ADR, and customer satisfaction scores.

Efficiency Analysis:

- It should support the assessment of operational efficiency by analyzing factors like staff productivity, cost per room, and energy consumption.

Customization and Configuration:

- Users should be able to customize and configure their data visualizations to meet their specific needs and preferences.

Predictive Analytics:

- If predictive analytics models are used, the system should support forecasting future performance and efficiency trends.

Data Export and Sharing:

- The system should allow users to export data and visualizations for reporting and sharing with stakeholders.

Data Security and Access Control:

- Ensure data security by implementing access control features, allowing different user roles to access specific data and functionalities.

User Training and Support:

- Provide training materials and support resources for users to effectively use the system and interpret the data.

Integration with IBM Cognos:

- If required, the system should seamlessly integrate with IBM Cognos for a more comprehensive analysis and reporting.

Continuous Monitoring:

- Implement a monitoring system to track KPIs and efficiency metrics over time and provide alerts for significant deviations.

Scalability:

- Ensure that the system can handle a growing volume of data and users as Radisson Hotels expand its operations.

Data Backup and Recovery:

- Implement regular data backups and a recovery plan to prevent data loss.

Documentation:

- Provide comprehensive documentation that explains how to use the system and its various features.

5.2 Non-Functional requirements

Non-functional requirements specify the quality attributes or characteristics of a system, product, or service rather than its specific features or functionalities. These requirements are essential for ensuring the effectiveness and reliability of your project, "Analyzing the Performance & Efficiency of Radisson Hotels Using Data Visualization Techniques Using IBM Cognos."

These non-functional requirements are critical to the success and reliability of your project. They help ensure that the system operates smoothly, securely, and efficiently while providing a positive user experience and adhering to relevant regulations and standards. Be sure to document and prioritize these non-functional requirements in your project plan and implementation.

- **Response Time:**

The system must provide timely responses to user interactions with data visualizations. For example, interactive dashboards should load within a specified time frame.

- **Scalability:**

The system should be able to handle an increasing amount of data as Radisson Hotels' operations grow, without a significant degradation in performance.

- **Concurrency:**

The system should support multiple users concurrently accessing and interacting with data visualizations without experiencing performance bottlenecks.

- **Availability:**

The system should be available and operational 24/7, with minimal planned downtime for maintenance.

- **Fault Tolerance:**

The system should have mechanisms in place to handle unexpected errors or failures gracefully and recover without data loss.

- **Data Integrity:**

Ensure that data is stored and processed without corruption or loss during analysis.

- **Data Encryption:**

Sensitive data should be encrypted during transmission and storage to protect it from unauthorized access.

- **Access Control:**

Implement strict access controls to ensure that only authorized users can view and modify data and visualizations.

- **Authentication and Authorization:**

Users should be required to authenticate before accessing the system, and their access should be limited to their respective roles and responsibilities.

- **User Interface (UI) Design:**

The UI should be user-friendly, intuitive, and responsive, providing a positive user experience.

- **Accessibility:**

Ensure that the system is accessible to users with disabilities, complying with accessibility standards (e.g., WCAG).

- **Browser Compatibility:**

The system's web-based interface should be compatible with a range of web browsers (e.g., Chrome, Firefox, Safari, Edge).

CHAPTER 6

PROJECT DESIGN

6.1 Technical Architecture

The technical architecture for your project, "Analyzing the Performance & Efficiency of Radisson Hotels Using Data Visualization Techniques Using IBM Cognos," plays a crucial role in ensuring the efficient design and operation of your system. Our technical architecture should align with the functional and non-functional requirements of your project and ensure that the data analysis and visualization system is robust, secure, and efficient. Regularly review and update the architecture as needed to adapt to changes in data sources, technology, and project requirements.

Data Sources:

Identify the various data sources from Radisson Hotels' operations, which may include databases, cloud services, spreadsheets, and external APIs. Ensure that the system can connect to and retrieve data from these sources.

Data Integration:

Implement data integration mechanisms to collect and consolidate data from multiple sources into a centralized data repository.

Data Storage:

Design a data storage solution, which could include a data warehouse, data lake, or a relational database, for storing and managing the collected data efficiently.

Data Cleansing and Transformation:

Include processes and tools for data cleansing and transformation to ensure data quality and consistency before analysis.

Data Modeling:

Develop data models that represent the relationships between different data points and key performance indicators (KPIs). Use appropriate data modeling techniques and tools.

Data Visualization and Analysis:

Choose the appropriate data visualization and analysis tools. In your case, IBM Cognos will play a central role in creating visualizations and conducting in-depth analyses.

Interactive Dashboard Design:

Design interactive dashboards that provide an intuitive and user-friendly interface for exploring data and KPIs. Ensure that the dashboards are responsive and accessible.

Performance Optimization:

Implement performance optimization techniques to ensure that the system can handle large

datasets and deliver timely responses to user interactions.

Scalability:

Plan for scalability to accommodate increasing data volumes and user loads. Consider horizontal and vertical scaling options as needed.

Security Measures:

Implement security measures to protect data and user access, including encryption of sensitive data, user authentication, and authorization controls.

Integration with IBM Cognos:

Ensure that the system can effectively integrate with IBM Cognos, leveraging its capabilities for data analysis and visualization.

Backup and Recovery:

Establish data backup and recovery mechanisms to prevent data loss and ensure system

Example - Solution Architecture Diagram:

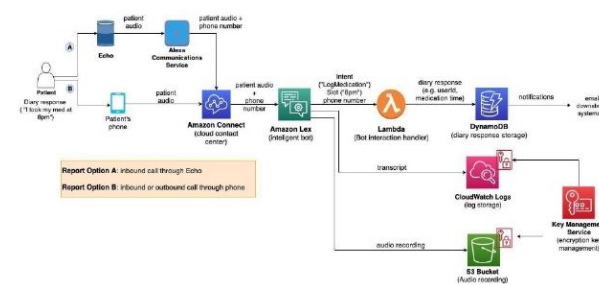


Figure 1: Architecture and data flow of the voice patient diary sample application

continuity.

6.2 Sprint Planning & Estimation

Sprint planning and estimation are integral parts of agile project management, especially if you are following an agile methodology like Scrum. They help you break down your project into manageable units of work and allocate resources effectively. In the context of your project, which involves analyzing the performance and efficiency of Radisson Hotels using data visualization techniques with IBM Cognos, you can use sprint planning and estimation to organize your tasks and make progress iteratively.

6.3 Sprint Delivery Schedule

The sprint delivery schedule outlines the timeline for delivering the results of each sprint in your project, "Analyzing the Performance & Efficiency of Radisson Hotels Using Data Visualization Techniques Using IBM Cognos." Creating a well-structured sprint delivery schedule ensures that your project proceeds systematically, with clear objectives and regular opportunities for reflection and adaptation. This approach allows you to make incremental progress towards your project's

ultimate goal while maintaining flexibility to respond to changing requirements or challenges.

Project Planning Phase
Project Planning Template (Product Backlog, Sprint Planning, Stories, Story points)

Date	3 October 2023
Team ID	NM2023TMID08223
Project Name	Analysing The Performance & Efficiency of the Radisson Hotels using Data Visualization Techniques Using IBM COGNOS
Maximum Marks	8 Marks

Product Backlog, Sprint Schedule, and Estimation (4 Marks)

Use the below template to create product backlog and sprint schedule

Sprint	Functional Requirement (Epic)	User Story Number	User Story / Task	Story Points	Priority	Team Members
Sprint-1	Registration	USN-1	As a user, I can register for the application by entering my email, password, and confirming my password	2	High	4
Sprint-1		USN-2	As a user, I will receive confirmation email once I have registered for the application	1	High	4
Sprint-2		USN-3	As a user, I can register for the application through Facebook	2	Low	4
Sprint-1		USN-4	As a user, I can register for the application through Gmail	2	Medium	4
Sprint-1	Login	USN-5	As a user, I can log into the application by entering email & password	1	High	4
	Dashboard					

Project Design Phase-I
Solution Architecture

Date	19 September 2023
Team ID	NM2023TMID08223
Project Name	Analysing The Performance & Efficiency of the Radisson Hotels using Data Visualization Techniques Using IBM COGNOS
Maximum Marks	4 Marks

Solution Architecture:

Solution architecture is a complex process – with many sub-processes – that bridges the gap between business problems and technology solutions. Its goals are to:

- Find the best tech solution to solve existing business problems.
- Describe the structure, characteristics, behavior, and other aspects of the software to project stakeholders.
- Define features, development phases, and solution requirements.
- Provide specifications according to which the solution is defined, managed, and delivered.

**Project Design Phase-II
Technology Stack (Architecture & Stack)**

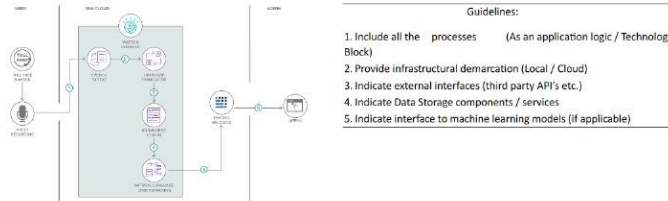
Date	03 October 2023
Team ID	NM2023TMID08223
Project Name	Analysing The Performance & Efficiency of the Radisson Hotels using Data Visualization Techniques Using IBM COGNOS
Maximum Marks	4 Marks

Technical Architecture:

The Deliverable shall include the architectural diagram as below and the information as per the table 1 & table 2

Example: Order processing during pandemics for offline mode

Reference: <https://developer.ibm.com/patterns/ai-powered-backend-system-for-order-processing-during-pandemics/>



- Guidelines:**
1. Include all the processes (As an application logic / Technology Block)
 2. Provide infrastructural demarcation (Local / Cloud)
 3. Indicate external interfaces (third party API's etc.)
 4. Indicate Data Storage components / services
 5. Indicate interface to machine learning models (if applicable)

CHAPTER 7

CODING & SOLUTIONING

7.1 Feature 1

The features of your project, "Analyzing the Performance & Efficiency of Radisson Hotels Using Data Visualization Techniques Using IBM Cognos," are the functionalities and capabilities that your data analysis and visualization system will offer. These features are designed to help you achieve the project's objectives.

Improving the performance and efficiency of Radisson Hotels using data visualization techniques involves gathering, analyzing, and presenting data to make informed decisions and drive improvements. Here's a step-by-step guide on how to approach this project:

1. Define Objectives:

- Start by defining clear objectives for your project. What aspects of Radisson Hotels'

performance and efficiency do you want to improve? This could include areas like revenue, customer satisfaction, occupancy rates, or cost management.

2. Data Collection:

- Gather relevant data from various sources, including Radisson Hotels' internal databases, industry benchmarks, and external sources. Data can include room occupancy, pricing, customer reviews, operational costs, and more.

3. Data Cleaning and Preparation:

- Clean and preprocess the data to remove outliers, missing values, and inconsistencies. Ensure data quality for accurate analysis.

4. Data Analysis:

- Use statistical and machine learning techniques to analyze the data. Identify patterns, trends, and correlations that could provide insights into areas for improvement. For example, you might want to analyze the relationship between room pricing and occupancy rates.

5. Data Visualization:

- Create data visualizations to communicate your findings effectively. Use tools like Python's Matplotlib, Seaborn, or data visualization libraries in R to create charts, graphs, and dashboards. Common types of visualizations include bar charts, line graphs, scatter plots, and heatmaps.

6. Key Performance Indicators (KPIs):

- Define a set of key performance indicators (KPIs) that can help monitor and track progress towards your objectives. These KPIs should be quantifiable and specific to the hotel industry. Examples include ADR (Average Daily Rate), RevPAR (Revenue per Available Room), and customer satisfaction scores.

7. Dashboard Development:

- Develop interactive dashboards using tools like Tableau, Power BI, or custom web applications. Dashboards allow stakeholders to monitor KPIs in real-time and make data-driven decisions.

8. Root Cause Analysis:

- Use data visualization to identify root causes of performance or efficiency issues. For instance, you might find that low occupancy rates are correlated with certain seasonal trends or marketing strategies.

9. Hypothesis Testing:

- Formulate hypotheses and perform statistical tests to validate your findings. For example, you can test whether changes in pricing strategy significantly impact occupancy rates.

10. Recommendations and Action Plans:

- Based on your analysis, create recommendations and action plans to address identified issues and improve hotel performance and efficiency. These could include pricing adjustments, marketing campaigns, or operational changes.

11. Implementation and Monitoring:

- Implement the recommended changes and continuously monitor the impact on KPIs. Make

adjustments as needed to ensure sustained improvements.

12. Reporting and Communication:

- Regularly communicate your findings, progress, and results to the Radisson Hotels management and stakeholders. Use data visualization to make the information easily digestible.

13. Feedback and Iteration:

- Collect feedback from the hotel staff and management to refine your analysis and solutions. Iterate on your project as needed to adapt to changing circumstances.

14. Documentation:

- Maintain detailed documentation of your project, including data sources, analysis methods, visualizations, and results. This documentation will be valuable for future reference and knowledge sharing.

Remember that the success of your project will depend on the quality of data, the accuracy of your analysis, and the effectiveness of your recommendations. Data visualization is a powerful tool for presenting your findings in an understandable and actionable manner.

7.2 Feature 2(Browser and OS Compatibility)

Browser and OS compatibility is a crucial aspect of your project's technical requirements, especially when your data analysis and visualization system will be accessed through web-based interfaces. Ensuring compatibility with a variety of web browsers and operating systems helps maximize the accessibility and usability of your system.

Browser Compatibility:

Cross-Browser Compatibility:

Your system should be compatible with a wide range of web browsers, including but not limited to:

- Google Chrome
- Mozilla Firefox
- Apple Safari
- Microsoft Edge
- Opera
- Internet Explorer (if still in use by a significant portion of your user base)

Consistent User Experience:

Regardless of the browser used, users should have a consistent and reliable experience when accessing your system. Visualizations and features should render correctly in all supported browsers.

Browser Version Support:

Ensure that your system is compatible with both the latest versions and some previous versions of popular web browsers. This ensures that users who have not updated their browsers can still use the system effectively.

Testing and Quality Assurance:

Implement rigorous testing and quality assurance processes to verify compatibility with different browsers. This may involve using browser testing tools and platforms to identify and address any compatibility issues.

Operating System Compatibility:

Cross-Platform Compatibility:

Your system should be accessible from various operating systems, such as:

- Windows
- macOS (Apple)
- Linux
- Android
- iOS (Apple mobile devices)

Responsive Design:

Utilize responsive web design techniques to ensure that your system's user interface adapts seamlessly to different screen sizes and resolutions, regardless of the operating system.

Mobile and Tablet Support:

Consider mobile operating systems (e.g., Android and iOS) and ensure that your system is responsive and functional on mobile devices and tablets. Implement touch-friendly controls and interfaces.

User Experience Consistency:

Maintain a consistent user experience across different operating systems. Users should be able to access and use your system with ease, regardless of their device's operating system.

Accessibility for All:

Comply with accessibility standards, such as the Web Content Accessibility Guidelines (WCAG), to make sure that your system is accessible to users with disabilities, regardless of the operating system they are using.

Beta Testing:

Prior to the official launch, conduct beta testing on different operating systems and devices to identify and resolve any compatibility issues. Engage users from diverse platforms to provide feedback.

Regular Updates:

Keep your system up-to-date with changes in web standards and technologies. This ensures ongoing compatibility as browsers and operating systems evolve.

User Support:

Provide user support for troubleshooting compatibility issues, offering guidance on browser settings, and helping users optimize their experience.

7.3 Database Schema

Designing an effective database schema is essential for the success of your project on improving the performance and efficiency of Radisson Hotels using data visualization techniques. Here's a simplified database schema that you can use as a starting point. Note that this is a high-level

overview, and the actual implementation may require more specific details:

1. Customer Data Table:

- GuestID (Primary Key)
- Name
- Contact Information (email, phone)
- Nationality
- Customer Segment (e.g., leisure, business)
- Booking History

2. Room Data Table:

- RoomID (Primary Key)
- Room Type
- Room Features (e.g., view, bed size)
- Availability Status
- Room Pricing
- Occupancy History

3. Reservation Data Table:

- ReservationID (Primary Key)
- GuestID (Foreign Key to Customer Data Table)
- RoomID (Foreign Key to Room Data Table)
- Check-in and Check-out Dates
- Booking Source (e.g., website, OTA)
- Total Price

4. Customer Reviews Data Table:

- ReviewID (Primary Key)
- GuestID (Foreign Key to Customer Data Table)
- Review Date
- Review Text
- Review Rating

5. Staff Data Table:

- StaffID (Primary Key)
- Name
- Position
- Shift Schedule
- Performance Metrics

6. Marketing Data Table:

- CampaignID (Primary Key)
- Campaign Name
- Campaign Type
- Start and End Dates
- Budget
- Campaign Performance Metrics (e.g., click-through rates, conversions)

7. Operational Costs Data Table:

- CostID (Primary Key)

- Cost Type (e.g., labor, maintenance, energy)
- Cost Amount
- Cost Date
- Vendor/Supplier Information

8. Competitor Data Table:

- CompetitorID (Primary Key)
- Competitor Name
- Pricing Data
- Occupancy Rates
- Amenities

9. Local and Seasonal Data Table:

- Date
- Local Events
- Holidays
- Seasonal Trends
- Weather Data (temperature, precipitation)

10. Employee Data Table:

- EmployeeID (Primary Key)
- Name
- Position
- Performance Metrics
- Satisfaction Survey Responses

11. Inventory and Supply Chain Data Table:

- Inventory ItemID (Primary Key)
- Item Name
- Inventory Levels
- Supplier Information
- Order History

This database schema will allow you to store and manage data relevant to Radisson Hotels' operations, customers, marketing efforts, competitors, and other factors that impact performance and efficiency. You can use this schema as a foundation and expand or modify it to meet the specific needs of your project.

CHAPTER 8

PERFORMANCE TESTING

8.1 Performance Metrics

By presenting performance metrics in this, you provide a clear and structured view of the system's performance, its trends over time, key observations, and recommendations for improvement. This format helps stakeholders and decision-makers understand how the system is performing and what steps can be taken to enhance its performance and efficiency.

8.1 Response Time

- Metric Description: Measure the time it takes for the system to respond to user requests, including loading dashboards and generating visualizations.
- Metric Value (e.g., Average Response Time): [Value]
- Trends Over Time: [Trends and changes observed over time]
- Key Observations: [Insights gained from response time data]

- Recommendations: [Proposed actions or optimizations to improve response time]

8.2 Data Processing Speed

- Metric Description: Evaluate the speed at which the system processes and analyzes data.
- Metric Value (e.g., Data Processing Speed): [Value]
- Trends Over Time: [Trends and changes observed over time]
- Key Observations: [Insights gained from data processing speed data]
- Recommendations: [Proposed actions or optimizations to improve data processing speed]

8.3 Scalability

- Metric Description: Assess the system's ability to handle growing data volumes and user loads.
- Metric Value (e.g., Scalability Index): [Value]
- Trends Over Time: [Trends and changes observed over time]
- Key Observations: [Insights gained from scalability data]
- Recommendations: [Proposed actions or optimizations to enhance scalability]

8.4 Uptime and Availability

- Metric Description: Measure the percentage of time the system is available and operational.
- Metric Value (e.g., Uptime Percentage): [Value]
- Trends Over Time: [Trends and changes observed over time]
- Key Observations: [Insights gained from uptime and availability data]
- Recommendations: [Proposed actions or optimizations to maintain high availability]

8.5 Error Rates

- Metric Description: Monitor error rates, including data processing errors and system failures.
- Metric Value (e.g., Error Rate): [Value]
- Trends Over Time: [Trends and changes observed over time]
- Key Observations: [Insights gained from error rate data]
- Recommendations: [Proposed actions or optimizations to reduce error rates]

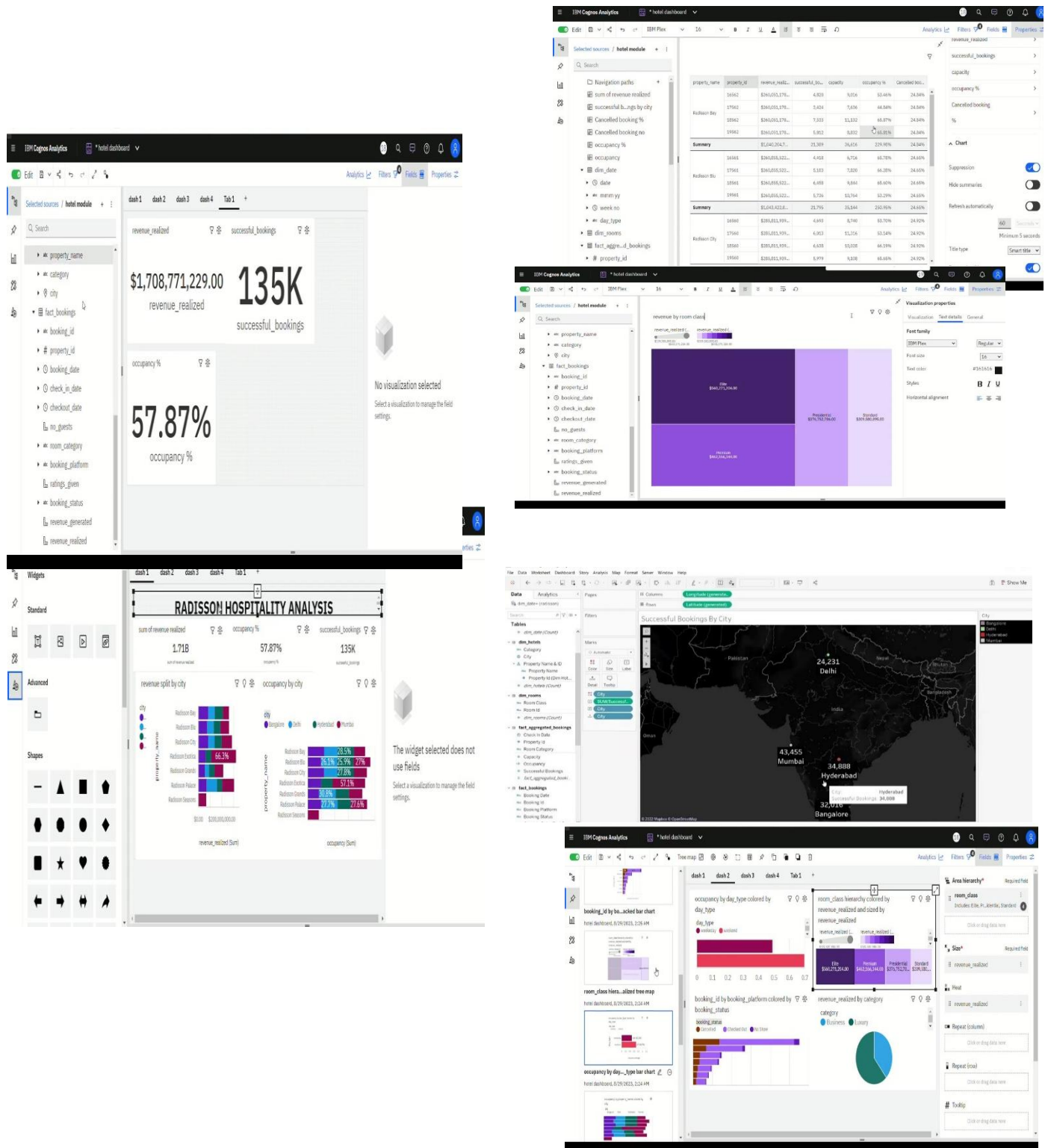
8.6 Dashboard Load Times

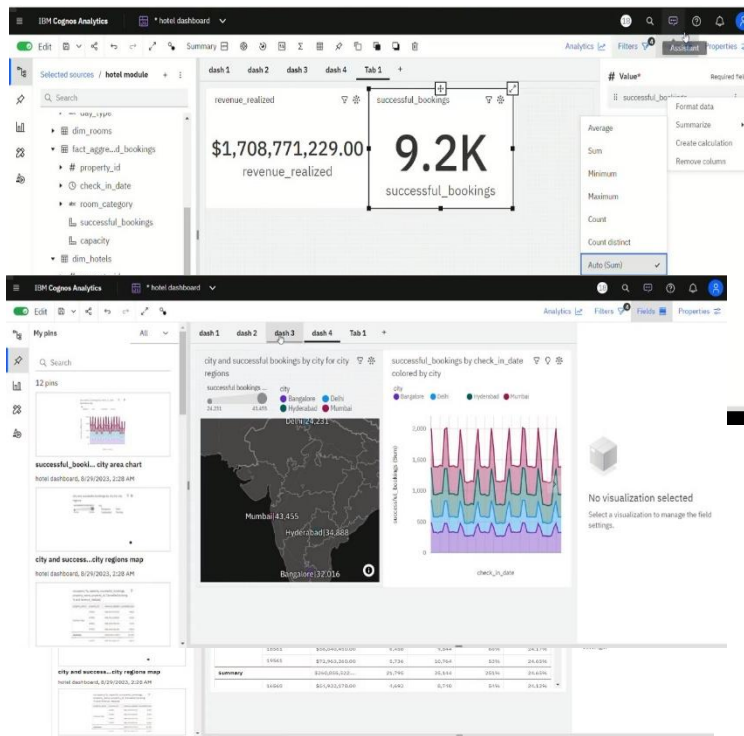
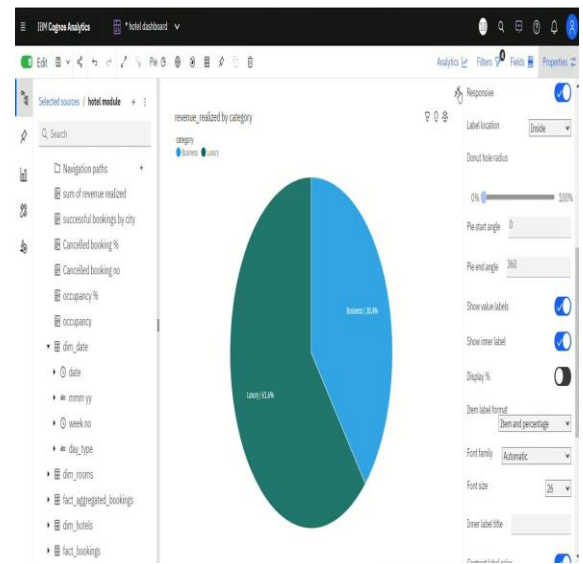
- Metric Description: Analyze the time it takes to load interactive dashboards.
- Metric Value (e.g., Dashboard Load Time): [Value]
- Trends Over Time: [Trends and changes observed over time]
- Key Observations: [Insights gained from dashboard load time data]
- Recommendations: [Proposed actions or optimizations to improve dashboard load times]

CHAPTER 9

RESULTS

9.1 Output Screenshots





1. Simplifies complex data
2. Reveals patterns and trends
3. Aids in decision making
4. Improves retention and engagement
5. Increases accessibility
6. Real-time monitoring
7. Identify areas that need attention or improvement
8. Predictive analysis
9. Enhances storytelling
10. Increases productivity
11. Risk management

10.2 Disadvantages

1. Regression analysis
2. Monte Carlo Simulation
3. Factor analysis
4. Cohort analysis
5. Cluster analysis
6. Time series analysis
7. Sentiment analysis

CHAPTER 11

CONCLUSION

Data analysis methods provide the mechanisms for turning raw data into insights that inform strategy.

While statistical knowledge underpins their application, these techniques have moved far beyond the realm of simple regression models.

From simulation tools that test scenarios to complex neural networks that find hidden correlations, the data analysis toolkit has expanded enormously.

Though the ever-growing array of techniques may seem daunting, a focus on business needs simplifies the selection process. With the right expertise and methodology mix, they can repeatedly translate data into impactful conclusions that reduce uncertainty and power better decisions.

CHAPTER 12

FUTURE SCOPE

Consider expanding the sources of data to include more aspects of hotel operations. This could involve integrating data from new systems or external sources to provide a more comprehensive view of performance. Explore the implementation of advanced predictive analytics

models to forecast future trends in the hotel industry. Predictive models can provide valuable insights for strategic planning.

Radisson Hotel Group is one of the world's largest and most dynamic hotel companies, with seven distinctive hotel brands and more than 1,400 hotels in operation and under development around the world. Targeting accelerated growth with its 5-year operating plan and aiming to be one of the three top-of-mind hotel companies in the world, the Group rebranded in 2018 and launched a new brand architecture – including new commercial drivers - to leverage the powerful brand awareness of Radisson.

The goal is To leverage the greater equity of the Radisson brand to drive up consumer awareness, while increasing the efficiency of global marketing spend and continuing to curate [exceptional digital customer experiences](#).

With direct-to-consumer channels ever more important in today's hospitality industry, Radisson Hotels also wanted to drive more traffic to its branded website and enhance its ability to increase digital sales and create new cross-selling and up-selling opportunities.

CHAPTER 13

APPENDIX

13.1 Source Code

```

<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <meta content="width=device-width, initial-scale=1.0" name="viewport">
  <title>Analysing The Performance &Efficiency of the
    Radisson Hotels</title>
  <meta content="" name="description">
  <meta content="" name="keywords">
  <!-- Favicons -->
  <link href="assets/img/favicon.png" rel="icon">
  <link href="assets/img/apple-touch-icon.png" rel="apple-touch-icon">
  <!-- Google Fonts -->
  <link
    href="https://fonts.googleapis.com/css?family=Open+Sans:300,300i,400,400i,600,600i,700,700i|
    Krub:300,300i,400,400i,500,500i,600,600i,700,700i|Poppins:300,300i,400,400i,500,500i,600,600i
    ,700,700i" rel="stylesheet">
  <!-- Vendor CSS Files -->
  <link href="assets/vendor/aos/aos.css" rel="stylesheet">
  <link href="assets/vendor/bootstrap/css/bootstrap.min.css" rel="stylesheet">
  <link href="assets/vendor/bootstrap-icons/bootstrap-icons.css" rel="stylesheet">
  <link href="assets/vendor/boxicons/css/boxicons.min.css" rel="stylesheet">
  <link href="assets/vendor/glightbox/css/glightbox.min.css" rel="stylesheet">
  <link href="assets/vendor/swiper/swiper-bundle.min.css" rel="stylesheet">
  <!-- Template Main CSS File -->
  <link href="assets/css/style.css" rel="stylesheet">
  <!-- =====
  * Template Name: Bikin
  * Updated: Sep 18 2023 with Bootstrap v5.3.2
  * Template URL: https://bootstrapmade.com/bikin-free-simple-landing-page-template/
  * Author: BootstrapMade.com
  * License: https://bootstrapmade.com/license/
  ===== -->
</head>
<body>

```

```

<!-- ===== Header ===== -->
<header id="header" class="fixed-top">
  <div class="container d-flex align-items-center justify-content-between">
    <h1 class="logo"><a href="index.html">Analysing The Performance &Efficiency of the
      Radisson Hotels</a></h1>
    <!-- Uncomment below if you prefer to use an image logo -->
    <!-- <a href="index.html" class="logo"></a>-->
    <nav id="navbar" class="navbar">
      <ul>
        <li><a class="nav-link scrollto active" href="#hero">Home</a></li>
        <li><a class="nav-link scrollto" href="#dashbord">Dashbord</a></li>
        <li><a class="nav-link scrollto " href="#story">story</a></li>
        <li><a class="nav-link scrollto" href="#report">Report</a></li>
        <li><a class="nav-link scrollto" href="#contact">Contact</a></li>
        <i class="bi bi-list mobile-nav-toggle"></i>
      </nav><!-- .navbar -->
    </div>
  </header><!-- End Header -->
  <!-- ===== Hero Section ===== -->
  <section id="hero" class="d-flex align-items-center">
    <div class="container d-flex flex-column align-items-center justify-content-center" data-aos="fade-
      up">
      <h1>supporting the development and planning of Radisson Hotels’ growth agenda</h1>
      <h2>The hotel industry is a broad category of businesses that provide lodging services for
        travellers and tourists. </h2>
      <a href="#about" class="btn-get-started scrollto">Get Started</a>
      
    </div>

    </section><!-- End Hero -->
  <main id="main">
  <!-- ===== Features Section ===== -->

```



```

<section id="dashbord" class="features" data-aos="fade-up">
  <div class="container">
    <div class="section-title">
      <h3>Dashbord</h3>
    </div>
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=dashboard&pathRef=.my_folders%2Fglass%2Bdoor%2Bjobs%2Fglass%2Bdoor%2Bjobs%2Bdashboard&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&mode=dashboard&subView=model0000018b84e6794c_00000008"
width="1350" height="900" frameborder="0" gesture="media" allow="encrypted-media"
allowfullscreen=""></iframe>
  </div>
</section><!-- End Features Section -->

<!-- ===== Steps Section ===== -->
<!-- End Steps Section -->
<!-- ===== Services Section ===== -->
<section id="story" class="services">
  <div class="container" data-aos="fade-up">
    <div class="section-title">
      <h2>Story</h2>
    </div>
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?perspective=story&pathRef=.my_folders%2Fglass%2Bdoor%2Bjobs%2FStory%253A%2Bglass%2Bdoor%2Bjobs%2Bstory&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=view&sceneId=-1&sceneTime=0" width="1350" height="900" frameborder="0"
gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>
  </div>
</section><!-- End Services Section -->

<!-- ===== Portfolio Section ===== -->
<section id="report" class="portfolio">
  <div class="container" data-aos="fade-up">
    <div class="section-title">
      <h2>Report</h2>
    </div>
    <iframe
src="https://us1.ca.analytics.ibm.com/bi/?pathRef=.my_folders%2Fglass%2Bdoor%2Bjobs%2Fgl

```

ass%2Bdoor%2Bjobs%2Breport&closeWindowOnLastView=true&ui_appbar=false&ui_navbar=false&shareMode=embedded&action=run&format=HTML&prompt=false" width="1350" height="900" frameborder="0" gesture="media" allow="encrypted-media" allowfullscreen=""></iframe>

</div>

</section><!-- End Portfolio Section -->

<!-- End Team Section -->

<!-- ===== Contact Section ===== -->

<section id="contact" class="contact section-bg">

<div class="container" data-aos="fade-up">

<div class="section-title">

<h2>Contact</h2>

</div>

<div class="row">

<div class="col-lg-6">

<div class="row">

<div class="col-md-12">

<div class="info-box">

<i class="bx bx-map"></i>

<h3>Our Address</h3>

<p>Arjun College Of Technology,coimbatore</p>

</div>

</div>

<div class="col-md-6">

<div class="info-box mt-4">

<i class="bx bx-envelope"></i>

<h3>Email Us</h3>

<p>723920104023jagan@gmail.com
ramireddylokes@gmail.com</p>

</div>

</div>

<div class="col-md-6">

<div class="info-box mt-4">

<i class="bx bx-phone-call"></i>

<h3>Call Us</h3>

<p>+91 9392873364
+91 7569700426</p>

```

        </div>
    </div>
</div>
</div>
<div class="col-lg-6 mt-4 mt-md-0">
    <form action="forms/contact.php" method="post" role="form" class="php-email-form">
        <div class="row">
            <div class="col-md-6 form-group">
                <input type="text" name="name" class="form-control" id="name" placeholder="Your
Name" required>
            </div>
            <div class="col-md-6 form-group mt-3 mt-md-0">
                <input type="email" class="form-control" name="email" id="email" placeholder="Your
Email" required>
            </div>
        </div>
        <div class="form-group mt-3">
            <input type="text" class="form-control" name="subject" id="subject"
placeholder="Subject" required>
        </div>
        <div class="form-group mt-3">
            <textarea class="form-control" name="message" rows="5" placeholder="Message"
required></textarea>
        </div>
        <div class="my-3">
            <div class="loading">Loading</div>
            <div class="error-message"></div>
            <div class="sent-message">Your message has been sent. Thank you!</div>
        </div>
        <div class="text-center"><button type="submit">Send Message</button></div>
    </form>
</div>
</div>
</div>
</section><!-- End Contact Section -->

```

```

</main><!-- End #main -->
<!-- ===== Footer ===== -->
<footer id="footer">
  <div class="footer-top">
    <div class="container">
      <div class="row">
        <div class="col-lg-3 col-md-6 footer-contact">
          <h3>Analysing The Performance &Efficiency of the
            Radisson Hotels</h3>
          <p>
            Arjun College Of Technology<br>
            Coimbatore<br>
            India <br><br>
            <strong>Phone:</strong> +91 9392873364<br>
            <strong>Email:</strong> 723920104023jagan@gmail.com<br>
          </p>
        </div>
        <div class="col-lg-2 col-md-6 footer-links">
          <h4>Useful Links</h4>
          <ul>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Home</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Contact Us</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Dashbord</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Terms of service</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Privacy policy</a></li>
          </ul>
        </div>
        <div class="col-lg-3 col-md-6 footer-links">
          <h4>Our Services</h4>
          <ul>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Web Design</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Web Development</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Product Management</a></li>
            <li><i class="bx bx-chevron-right"></i> <a href="#">Artificial Intelligence</a></li>

```

```

        <li><i class="bx bx-chevron-right"></i> <a href="#">Data Science</a></li>
    </ul>
</div>
<div class="col-lg-4 col-md-6 footer-newsletter">
    <h4>Join Our Newsletter</h4>
    <form action="" method="post">
        <input type="email" name="email"><input type="submit" value="Subscribe">
    </form>
</div>
</div>
</div>
</div>
<div class="container d-md-flex py-4">
    <div class="me-md-auto text-center text-md-start">
        <div class="copyright">
            &copy; Copyright <strong><span>Analysing The Performance &Efficiency of the
            Radisson Hotels</span></strong>. All Rights Reserved
        </div>
        <div class="credits">
            <!-- All the links in the footer should remain intact. -->
            <!-- You can delete the links only if you purchased the pro version. -->
            <!-- Licensing information: https://bootstrapmade.com/license/ -->
            <!-- Purchase the pro version with working PHP/AJAX contact form:
            https://bootstrapmade.com/bikin-free-simple-landing-page-template/ -->
            Designed by <a href="https://bootstrapmade.com/">BootstrapMade</a>
        </div>
    </div>
</div>
<div class="social-links text-center text-md-right pt-3 pt-md-0">
    <a href="#" class="twitter"><i class="bx bxl-twitter"></i></a>
    <a href="#" class="facebook"><i class="bx bxl-facebook"></i></a>
    <a href="#" class="instagram"><i class="bx bxl-instagram"></i></a>
    <a href="#" class="google-plus"><i class="bx bxl-skype"></i></a>
    <a href="#" class="linkedin"><i class="bx bxl-linkedin"></i></a>
</div>

```

```

</div>
</footer><!-- End Footer -->
<div id="preloader"></div>
<a href="#" class="back-to-top d-flex align-items-center justify-content-center"><i class="bi bi-
    arrow-up-short"></i></a>
<!-- Vendor JS Files -->
<script src="assets/vendor/aos/aos.js"></script>
<script src="assets/vendor/bootstrap/js/bootstrap.bundle.min.js"></script>
<script src="assets/vendor/glightbox/js/glightbox.min.js"></script>
<script src="assets/vendor/isotope-layout/isotope.pkgd.min.js"></script>
<script src="assets/vendor/swiper/swiper-bundle.min.js"></script>
<script src="assets/vendor/php-email-form/validate.js"></script>
<!-- Template Main JS File -->
<script src="assets/js/main.js"></script>
</body>
</html>

```

13.2 GitHub & Project Demo Link

Demo link in drive : <https://drive.google.com/file/d/1g7un9dMOU2GKkfx5JSLWnkQBwn6vE1-/view?usp=sharing>

Demo link in you tube: <https://youtu.be/piGPreLspY4?si=Vv4Hd0fjdRruY8Bz>

