**Hotel Booking Demand Analysis**

### **Our Team**

**13th team:**

Muhammad Eka Ihza Muzaki, Muhammad Iqbal, Yudistira Wahyu, Tria Ayu, and Sophia Tisinuruljannah

### **Project Overview**

**Context:** The hotel industry faces challenges in understanding booking patterns, managing cancellations, optimizing pricing, and improving customer retention. By analyzing historical booking data, hotels can gain valuable insights into customer behavior and make data-driven decisions to enhance operational efficiency and customer satisfaction.

**Objective:** This project aims to analyze hotel booking demand data to identify trends, understand customer demographics, analyze pricing strategies, and investigate cancellation patterns and repeat guest behaviors. The insights derived from this analysis will help hotel management optimize operations, enhance marketing strategies, and improve the overall customer experience.

### **Scope**

The scope of this analysis includes:

* Data cleaning and preparation
* Exploratory data analysis (EDA) focusing on the identified problems
* Creation of visualizations to illustrate findings
* Development of a dashboard in Tableau Public
* Documentation and presentation of insights and recommendations

### **Problem Definition & Business Questions**

#### **Cancellation Analysis**

* **Problem Statement**: High cancellation rates can significantly impact a hotel's revenue and business sustainability.
* **Business Questions:** What are the key factors influencing booking cancellations  
  - What are the proportions of bookings canceled and how can hotels reduce cancellation rates?
* **Metrics Used:**is\_canceled: Indicates if a booking was canceled.  
  lead\_time: number of days between the booking date and the arrival date.  
  deposit\_type: type of deposit made (no Deposit, non-refundable, refundable)  
  previous\_cancellations: number of previous cancellations by the customer.  
  booking\_changes: number of changes made to the booking.

#### **Booking Trends**

* **Problem Statement**: Understanding booking trends is crucial for hotels to plan their resources, marketing campaigns, and promotional activities.
* **Business Questions:** How do hotel booking patterns vary by month and year?
* **Metrics Used:**   
  arrival\_date\_year: year of arrival date.  
  arrival\_date\_month: month of arrival date.   
  arrival\_date\_day\_of\_month: day of arrival date.  
  hotel: type of hotel (city hotel or resort hotel).

#### **Customer Demographics**

* **Problem Statement**: Knowing the demographics of hotel guests helps in tailoring services and marketing efforts to different customer segments.
* **Business Question**: What are the characteristics of hotel guests in terms of adults, children, and babies, and how do these demographics vary between city and resort hotels?
* **Metrics Used:**   
  adults: number of adults.  
  children: number of children.  
  babies: number of babies.  
  country: country of origin of the guests.

#### **Pricing Analysis**

* **Problem Statement**: Pricing strategies are vital for maximizing hotel revenue and maintaining competitiveness.
* **Business Question**: How does the Average Daily Rate (ADR) vary with different booking conditions such as lead time, length of stay, and customer type, and how can pricing be optimized?
* **Metrics Used:**   
  adr: Average Daily Rate.  
  lead\_time: number of days between the booking date and the arrival date.  
  stays\_in\_weekend\_nights: Number of weekend nights stayed.  
  stays\_in\_week\_nights: number of weeknights stayed.  
  customer\_type: type of booking (e.g., contract, group?).

### **Stakeholders**

* **Primary Stakeholders**: Hotel Management, MarketingTeams, and Revenue Managers
* **Secondary Stakeholders**: Operations Managers, Customer Service Teams

### **Requirements**

#### **Functional Requirements**

1. **Data Analysis and Cleaning**:
   * Load and inspect the dataset.
   * Handle missing values, convert data types, and remove duplicates.
2. **Exploratory Data Analysis (EDA)**:
   * Conduct EDA focusing on booking trends, cancellations, customer demographics, pricing analysis, and repeat guests.
3. **Visualizations**:
   * Create visualizations to communicate findings effectively.
   * Develop an interactive dashboard in Tableau Public.
4. **Reporting**:
   * Document the analysis process and findings.
   * Prepare a presentation summarizing insights and recommendations.

#### **Non-Functional Requirements**

1. **Performance**: Ensure the analysis is efficient and the dashboard is responsive.
2. **Data Accuracy**: Maintain high data accuracy and integrity throughout the analysis.
3. **Usability**: Ensure the dashboard and reports are user-friendly and accessible to stakeholders.

### **Data Sources**

**Primary Data Source**: Hotel Booking Demand dataset from Kaggle (<https://www.kaggle.com/datasets/jessemostipak/hotel-booking-demand>)

### **Project Deliverables**

1. **Dashboard**: An interactive dashboard in Tableau Public showcasing key insights.
2. **Analysis Notebook**: A Jupyter Notebook/Google Colab documenting data processing, analysis, and visualizations.
3. **Presentation Slides**: A slide deck detailing the project, insights found, and instructions for using the dashboard.

### **Timeline**

| **Milestone** | **Due Date** |
| --- | --- |
| Data Loading and Initial Analysis |  |
| Data Cleaning and Preparation |  |
| Exploratory Data Analysis |  |
| Visualization Creation |  |
| Dashboard Development |  |
| Reporting and Documentation |  |
| Presentation Preparation |  |
| Final Review and Submission |  |

### **Risks and Mitigations**

| **Risk** | **Mitigations** |
| --- | --- |
| Data Quality Issues | Implement thorough data cleaning and validation |
| Performance Bottlenecks | Optimize data processing and use efficient queries |
| Stakeholder Misalignment | Regular updates and feedback sessions with stakeholders |
| Tool/Software Limitations | Use alternative tools or adjust scope accordingly |