Airbnb Dashboard Project Report

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1. Introduction

The Airbnb Dashboard Project aims to analyse and visualize Airbnb data to uncover insights related to pricing trends, property performance, customer preferences, and host activities. The project's purpose is to assist hosts, analysts, and business stakeholders in making data-driven decisions to optimize listings, maximize revenue, and improve the guest experience. Using Power BI, this project transforms raw Airbnb datasets into an interactive and insightful dashboard that simplifies data interpretation and supports strategic planning.

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2. Abstract

This project involves collecting, cleaning, and analysing Airbnb dataset(s) and visualizing key performance metrics such as Average Daily Rate (ADR), Occupancy Rate, Revenue per Available Room (RevPAR), and guest ratings. The dashboard provides an overview of city-level performance, pricing distribution, and booking behaviour. Advanced analytics features such as filters, maps, and trend visualizations allow users to explore data dynamically. The findings highlight seasonal demand patterns, identify profitable neighbourhoods, and suggest pricing strategies. The outcome of this project demonstrates the power of Business Intelligence (BI) tools in transforming large datasets into actionable insights.

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3. Tools Used

The following tools and technologies were used in developing the Airbnb Dashboard:

- **Power BI Desktop:** For data visualization and dashboard creation.
- **Microsoft Excel / CSV:** For preliminary data exploration and cleaning.
- **Power Query:** For data transformation, merging, and shaping before visualization.
- **DAX (Data Analysis Expressions):** For creating calculated columns and measures like Revenue, ADR, and Occupancy Rate.
- **Python / Pandas (optional):** Used for exploratory data analysis and pre-processing.

4. Steps Involved in Building the Project

The process of building the Airbnb Dashboard involved the following key steps:

Step 1: Data Collection

The dataset was collected from Airbnb open data sources, typically containing information about listings, hosts, reviews, and pricing. It included attributes such as listing ID, neighbourhood, room type, price, number of reviews, and availability.

Step 2: Data Cleaning

- Removed duplicates and irrelevant columns.
- Handled missing values and standardized column names.
- Converted text-based numeric fields (like prices) into numerical format.
- Fixed date formatting for time-based analysis.

Step 3: Data Transformation

- Used Power Query to merge multiple tables (listings, calendar, reviews, hosts).
- Built a calendar table to enable time-series analysis.

Step 4: Data Modelling

- Defined relationships in Power BI to ensure consistent data aggregation.

Step 5: Visualization and Dashboard Design

- Created KPI cards for Total Revenue, ADR, Occupancy Rate, and Total Bookings.
- Designed charts such as:
    - **Bar/Column charts:** for top neighbourhoods and property types.
    - **Line charts:** to visualize monthly revenue and booking trends.
    - **Map visuals:** to represent geographic distribution of listings.
    - **Pie/Donut charts:** to show room type distribution.
- Added slicers and filters for interactivity (city, room type, time period).

Step 6: Insights & Interpretation

- Identified high-performing neighbourhoods with high occupancy and ADR.
- Detected seasonal trends showing demand peaks in specific months.
- Found underperforming listings with low occupancy despite higher pricing.

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5. Conclusion

The Airbnb Dashboard Project successfully demonstrates how data visualization and BI tools can help analyse large-scale hospitality data effectively. The insights derived from this analysis empower hosts and managers to make better pricing, marketing, and investment decisions. Through Power BI, users can easily monitor performance metrics, understand market trends, and improve customer satisfaction. Overall, this project highlights the practical application of analytics in enhancing operational efficiency and profitability within the short-term rental market.
