

Data Analysis Report

In this report, I aim to analyze the booking data to find useful insights about revenue, booking dates, time slots, and customer preferences.

The goal is to understand trends that can help improve and increase bookings for this multi-service business. By looking at which time slots, booking types, and days generate the most revenue, the business can make better decisions to attract more customers and manage services more efficiently.

Introduction

The dataset provided consists of **1,000 rows and 18 columns**, containing booking details such as customer information, booking type, time slot, duration, facility, and Price.

The primary objective of this analysis was to clean the dataset, perform exploratory data analysis (EDA), and extract meaningful business insights.

Data Cleaning Process

Before loading the dataset into Jupyter Lab, preliminary cleaning was performed in Excel.

- The **Price column** was formatted as currency.
- The **Booking Date column** was converted to date format.
- The **Duration column** was changed to minutes format.
- The **Time Slot column** was formatted correctly.
- **Blank email entries** were filled with sample email values for consistency.

Once loaded into Jupyter Lab, the dataset was examined for missing values, revealing significant gaps.

Column Name	Missing Values
Class Type	672
Instructor	730
Time Slot	205
Duration (mins)	205
Facility	328
Theme	727
Subscription Type	1000
Customer Email	94
Customer Phone	105

To handle missing data:

- **Subscription Type** had no values and was removed.
- **Customer Email & Phone:** Missing values were replaced with "**Not Provided**".
- **Instructor:** Blank values were marked as "**Not Assigned**".
- **Class Type:** Missing values were replaced with "**Not Applicable**".
- **Facility:** Blank values were labeled as "**Unspecified**".
- **Theme:** Missing values were set to "**General**".
- **Time Slot & Duration:** Filled with **random values from existing records** to maintain consistency.
- **Price:** Missing values were replaced using the **median value** to avoid distortion.

Exploratory Data Analysis (EDA) and Business Insights

Price Distribution

- The majority of bookings fall within a certain price range, with a notable peak around **150**.
- The pricing structure suggests that most customers prefer mid-range bookings.

Duration Distribution

- Bookings **mostly standardized** to fixed durations of **45, 90, and 120 minutes**.
- **90 minutes** is the most frequently chosen duration, indicating a standard service length preference.

Booking Status Distribution

- The dataset includes multiple booking statuses, indicating active business operations with confirmed, pending, or canceled bookings.
- Understanding status trends can help optimize customer retention strategies.

Booking Type Trends

- **Facility bookings** have the highest count, showing a strong preference for venue-based services.
- **Birthday Party bookings** are also significant, reflecting a demand for event-based reservations.
- **Class bookings**, while slightly lower, still contribute a substantial share to the total bookings.

Peak Booking Hours

- **13:00 and 14:00** experience the highest number of bookings.
- A steady flow is observed between **10:00 - 12:00 and 15:00 - 16:00**.
- **17:00 has the lowest booking count**, indicating a potential off-peak period.

Revenue Insights

- **Facility bookings generate the highest revenue**, totaling approximately **54.7K**.
- The revenue trends show significant fluctuations over time, with some days witnessing sharp spikes.
- **Mid-April shows the highest revenue peak**, suggesting a seasonal demand or a special event.
- High volatility in **early April and August** indicates fluctuating customer activity.

- Some low-revenue days could be attributed to **weekends, holidays, or seasonal slowdowns.**

Key Takeaways & Recommendations

Optimize Off-Peak Hours: Since 17:00 has the lowest bookings, offering discounts or promotions during this time may help improve utilization.

Leverage Seasonal Peaks: Since mid-April sees a surge in revenue, businesses should introduce marketing campaigns or special packages around this period.

Standardize Duration Offerings: With 90-minute sessions being the most popular, businesses can create service bundles tailored to this duration.

Enhance Booking Type Strategies: Facility and event bookings contribute the most revenue, indicating a need to invest in targeted promotions for these services.

Investigate Revenue Volatility: Understanding why early April and August have fluctuating trends can help implement stability measures, such as loyalty programs or seasonal deals.

Conclusion

This analysis provided insights into customer booking patterns, peak hours, pricing trends, and revenue fluctuations. Addressing off-peak demand, leveraging seasonal opportunities, and refining service offerings can significantly enhance business performance.