Website Traffic Analysis Dashboard

1.Project Overview

Website traffic plays a crucial role in understanding how users interact with a digital platform. Businesses rely heavily on web analytics to improve user experience, marketing performance, and overall revenue. However, raw traffic data is often complex and difficult to interpret without proper visualization and analysis.

This project presents a comprehensive **Website Traffic Analysis Dashboard** built using **Microsoft Power BI**, leveraging a cleaned dataset containing essential metrics such as sessions, users, page views, conversions, and revenue. The dashboard transforms raw data into insightful visualizations to help decision-makers understand website performance effectively.

The project includes:

- Data cleaning and transformation
- KPI identification
- Dashboard creation in Power BI
- Insights and interpretation
- Final Documentation

2.Objectives of the Project

The primary objectives of this project are:

✔ **Analyze website user behavior**

Identify how users interact with the website, including activity patterns, engagement levels, and return frequency.

✔ **Evaluate website performance metrics**

Track performance indicators such as total sessions, new users, conversion rate, and revenue.

✔ **Visualize important KPIs**

Create a clean, professional, interactive Power BI dashboard for executives and marketing teams.

✔ **Identify actionable insights**

Understand high-performing traffic sources, device usage, and geographical patterns.

✔ **Support data-driven decisions**

Enable better strategic planning for website optimization and marketing campaigns.

3.Dataset Description

The dataset used for this project is sourced from Kaggle:**Web Marketing Campaign Performance Analysis Dataset**

Number of Records: Approximately **10,000+** rows of website traffic interactions.

Key Columns

Column Name	Description
date	Date of session
user_id	Unique user identifier
session_duration_seconds	Duration of the session
page_views	Number of pages visited
medium	Mobile / Desktop / Tablet
source	Organic, Social, Paid, Referral, Email, Direct
country	User's country
new_user	1 = new visitor, 0 = returning
conversions	Whether action was completed
revenue	Revenue generated
Device	Device used by visitors
Campaigns	The marketing campaign that brought the users

4.Tools and Technologies Used

4.1 Power BI Desktop

Main tool for creating dashboard visualizations.

4.2 Microsoft Excel

Used for initial inspection and data cleaning.

4.3 GitHub

Used as a version-controlled repository to store:

- Raw dataset
- Processed dataset
- PBIX dashboard file
- Screenshots
- Project report
- README.md

5. Data Cleaning and Preparation

Data cleaning is a critical part of this project to ensure accuracy and reliability. The following steps were performed:

5.1 Handling Missing Values

- Removed rows with empty or invalid dates
- Dropped sessions with missing user_id
- Ensured new_user, conversions, and revenue had no null values

5.2 Fixing Data Formats

- Converted date to **Date data type**
- Ensured numerical columns were stored as **Whole Number** or **Decimal**
- Standardized device names (e.g., “Mobile”, “Desktop”)

5.3 Removing Outliers

- Extremely large session durations (>10,000 seconds) were removed
- Unusually high revenue values were investigated

5.4 Data Validation

- Checked unique user count
- Verified session-duration distribution
- Confirmed page views had logical ranges

5.5 Final Cleaned Dataset

Saved as:

website_traffic_cleaned.xlsx

6. Dashboard Design

The Power BI dashboard consists of:

6.1 KPI Cards

- Total Users
- New Users
- Total Page Views
- Page Views Per Second
- Avg Session Duration
- Conversion Rate

6.2 Visualizations

Line Chart: Shows traffic growth or decline over time.

Scatter Plot: Analyzes relationship between engagement metrics.

Donut Chart: Shows device usage distribution.

Map Visual: Shows geographic distribution of visitors.

Area Chart: Displays traffic source contribution trend

6.3 DAX Measures Used

Core KPI Measures

Total Sessions = COUNTROWS('web_marketing_data')

Total Users = DISTINCTCOUNT('web_marketing_data'[user_id])

New Users = SUM('web_marketing_data'[new_user])

Returning Users = [Total Users] - [New Users]

Total Page Views = SUM('web_marketing_data'[page_views])

Avg Session Duration = AVERAGE('web_marketing_data'[session_duration_seconds])

Avg Session Duration (Minutes) = DIVIDE([Avg Session Duration],60)

Total Conversions = SUM('web_marketing_data'[conversions])Conversion Rate = DIVIDE([Total Conversions],[Total Sessions])

Total Revenue = SUM('web_marketing_data'[revenue])

Revenue Per Session = DIVIDE([Total Revenue],[Total Sessions])

Revenue Per User = DIVIDE([Total Revenue],[Total Users])

7. Analysis & Insights

Based on the dashboard:

7.1 Traffic Performance

- Website receives stable daily traffic
- Sessions peak during weekends
- Organic and Social traffic contribute maximum sessions

7.2 User Behavior

- Mobile users account for more than **60%**
- Returning users show **higher engagement**
- Page views per session are higher for Desktop users

7.3 Conversion & Revenue

- Conversion rate increases with higher session duration

- Returning users generate more revenue per session
- Paid traffic has lower sessions but **higher conversion rate**

7.4 Geographic Trends

Top countries based on page views:

- United States
- United Kingdom
- India

7.5 Key Takeaways

- Improve mobile page loading performance
- Invest more in organic and social channels
- Target high-revenue regions with campaigns

8. Conclusion

The Website Traffic Analysis project successfully demonstrates the ability to convert raw marketing data into meaningful insights using Power BI. By analyzing user behavior, engagement metrics, device usage, and revenue trends, the dashboard becomes a powerful decision-making tool for marketing teams and business analysts.

The structured visuals provide clarity on what drives engagement and conversions,

helping teams optimize strategies for improved website performance.

9. Future Enhancements

Future improvements to enhance the project include:

- Integration of live Google Analytics API
- Predictive modeling using machine learning
- Automated alerts for traffic drops or spikes
- Deeper segmentation using customer personas
- Cohort analysis for retention and churn

10.Screenshot