

E-Commerce Website Traffic Analytics – Tableau Project

Project Overview

This project demonstrates **end-to-end analysis of an e-commerce website traffic dataset** to generate actionable insights for marketing and user engagement strategies.

The goal was to:

- Optimize **marketing campaigns**
- Increase **user engagement**
- Improve **conversion rates**

Tools & Technologies:

- Data cleaning and preprocessing: Python (pandas)
- Visualization & dashboarding: Tableau
- Dataset: E-commerce website traffic (June 2023)

Figure 1: Dataset from Kaggle by Sulaman Ahmed

web_marketing_data.csv (719.94 kB)

Detail Compact Column

10 of 12 columns ▾

Date	User_ID	# Session_Duration	# Page_VIEWS	Source	Medium	Campaign
2023-06-01 2023-06-30	1	10000	60	Direct	25%	Spring Promo 26%
			600	Organic	25%	[null] 25%
			1	Other (4966)	50%	Other (4914) 49%
			10	Other (4950)	50%	
6/6/2023	1	448	7	Referral	Direct	Spring Promo
6/19/2023	2	94	1	Referral	Social Media	Summer Sale
6/29/2023	3	595	6	Direct	Referral	Winter Campaign
6/1/2023	4	263	9	Social	Organic Search	
6/30/2023	5	242	1	Referral	Referral	Spring Promo
6/30/2023	6	421	6	Organic	Direct	Summer Sale
6/21/2023	7	359	6	Referral	Direct	Summer Sale
6/28/2023	8	448	9	Organic	Direct	
6/7/2023	9	185	8	Referral	Referral	Winter Campaign

Business Problem

We needed to understand:

1. Which regions generate the most users for **targeted advertising**
2. Which **marketing mediums** drive the highest conversions
3. Days with **high session duration** and its correlation with conversions
4. Comparison of **new vs returning users** for marketing effectiveness
5. User behavior across **device types** and impact on conversion

The project leverages **descriptive analytics** to understand historical performance and guide future marketing strategy.

Data Pre-Processing

Data cleaning ensures **high-quality inputs** for accurate analysis.

Steps Taken:

- Checked for **nulls and duplicates** using Python
- Missing campaign values were replaced with '**Others**' to retain traffic data
- Exported cleaned dataset for Tableau visualization
- Verified **data types** and transformed columns as needed

Code 1: Python Code to find any Null or Duplicate Values

```
✓ 0s   import pandas as pd

      df = pd.read_csv('/content/web_marketing_data.csv')
      print(f'Null Values per column: {df.isnull().sum()}')
      print(f'Duplicate rows: {df.duplicated().sum()}')
```

Figure 2: Result of above code

```
→ Null Values per column: Date
    User_ID                  0
    Session_Duration         0
    Page_VIEWS               0
    Source                   0
    Medium                   0
    Campaign                 2490
    Device_Category          0
    Country                  0
    New_User                 0
    Conversions              0
    Revenue                  0
    dtype: int64
    Duplicate rows: 0
```

Code 2: Renaming Missing Values as No Campaign and Saving the Cleaned File

```
[8] df['Campaign'] = df['Campaign'].fillna('Others')
[9] df.to_excel('Cleaned Website Marketing Dataset.xlsx', index=False)
```

Figure 3: Data Type Solution

The screenshot shows the Microsoft Power BI Data Types pane open over a dataset. The pane is titled 'Sheet1 (Website Marketing Dataset)' and displays the data type for the 'Date' column. The 'Date' data type is highlighted with a blue border. Other options shown include Number (whole), Date & Time, String, Spatial, Boolean, and Default. Below the data types, the table structure is visible with columns: Date, User ID, Session Duration, Page Views, Source, Medium, Campaign, and Dev. The 'Date' column is currently selected.

Key Performance Indicators (KPIs)

Metric	Description
Session Duration	Length of user session (seconds)
Page Views	Number of pages viewed
Source	Traffic origin (direct, referral, social, organic)
Medium	Marketing medium
Campaign	Campaign season

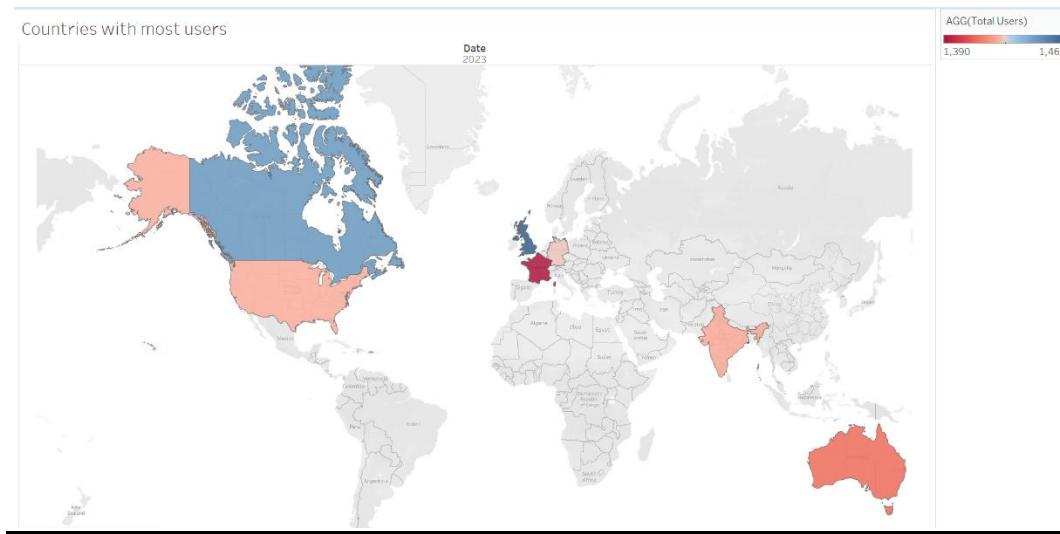
Device Category	Device type used
Country	User location
New User	1 for new, 0 for returning
Conversion	Number of conversions
Revenue	Revenue generated per session

Analysis Objectives & Insights

1. Regional User Distribution

Objective: Identify top regions for targeted advertising

Figure 4: World Map Showing Countries with Most Users

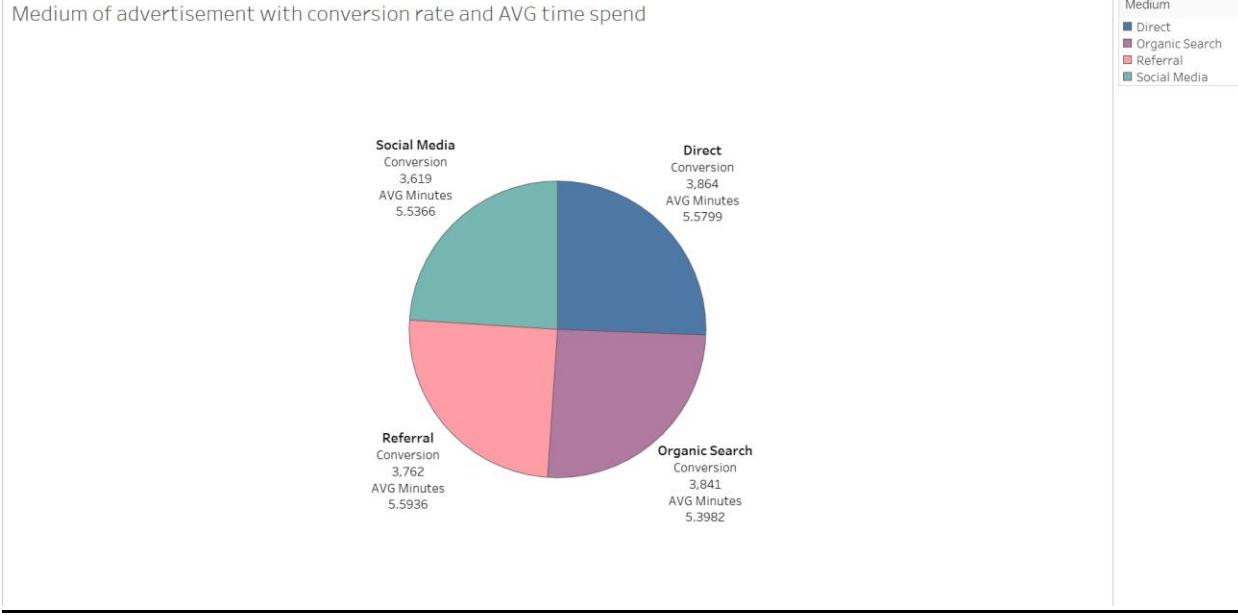


Insight: Most users come from France, Germany, UK; high potential to focus ad spend here.

2. Marketing Medium Performance

Objective: Determine which channels drive highest conversions

Figure 5: Pie Chart showing Conversion rate and session duration in relation to Medium of Advertisement

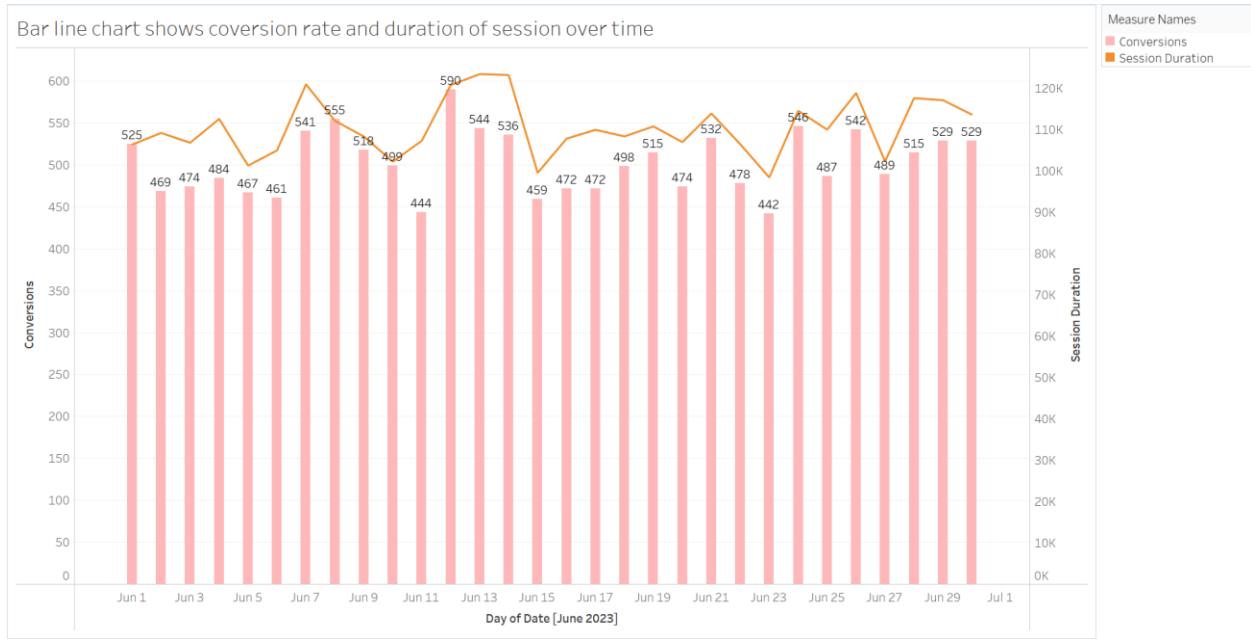


Insight: Direct and organic traffic generated the most conversions. Referral and social campaigns also contributed significantly.

3. Session Duration vs Conversions

Objective: Analyze correlation between session duration and conversions

Figure 6: Bar Line Chart showing Duration of session by no of conversion over time

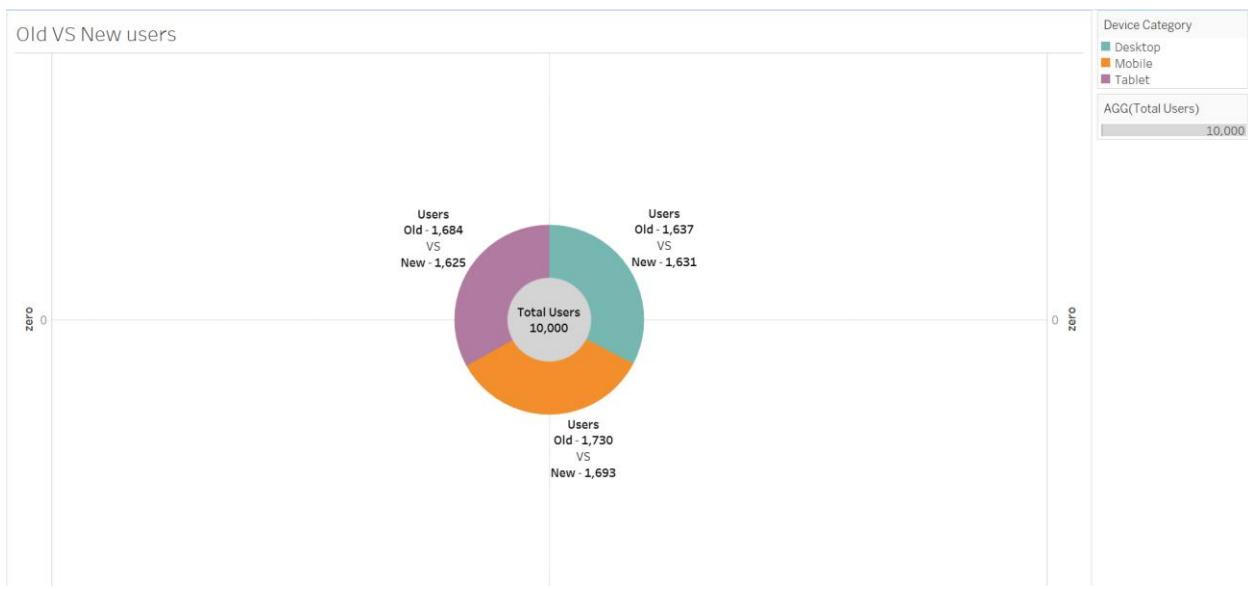


Insight: Longer session durations on certain days corresponded with higher conversion, highlighting the importance of engaging website content.

4. New vs Returning Users

Objective: Assess marketing effectiveness for June

Figure 7: Donut Chart Comparing Number of Old VS New Users gained during June ([Link](#))



For this chart we had to create two new measures ‘Total users’ and ‘Old users’, as seen below.

Figure 8: Calculated field to calculate Total users

X

```
COUNT([New User])
```

▶

The calculation is valid.

3 Dependencies ▾

Figure 9: Calculated field to calculate old users

Old Users

COUNT([User ID]) - SUM([New User])

The calculation is valid.

2 Dependencies ▾

These two calculated fields show how we created two new measures for the purpose of our Donut chart i.e ‘Total users’ and ‘Old users’.

Insight: Nearly 50% of users were new, indicating effective acquisition campaigns.

5. Device Category Analysis

Objective: Understand user behavior by device and impact on conversions

Figure 10: Side by Side Bar Chart showing type of device total users Vs conversion

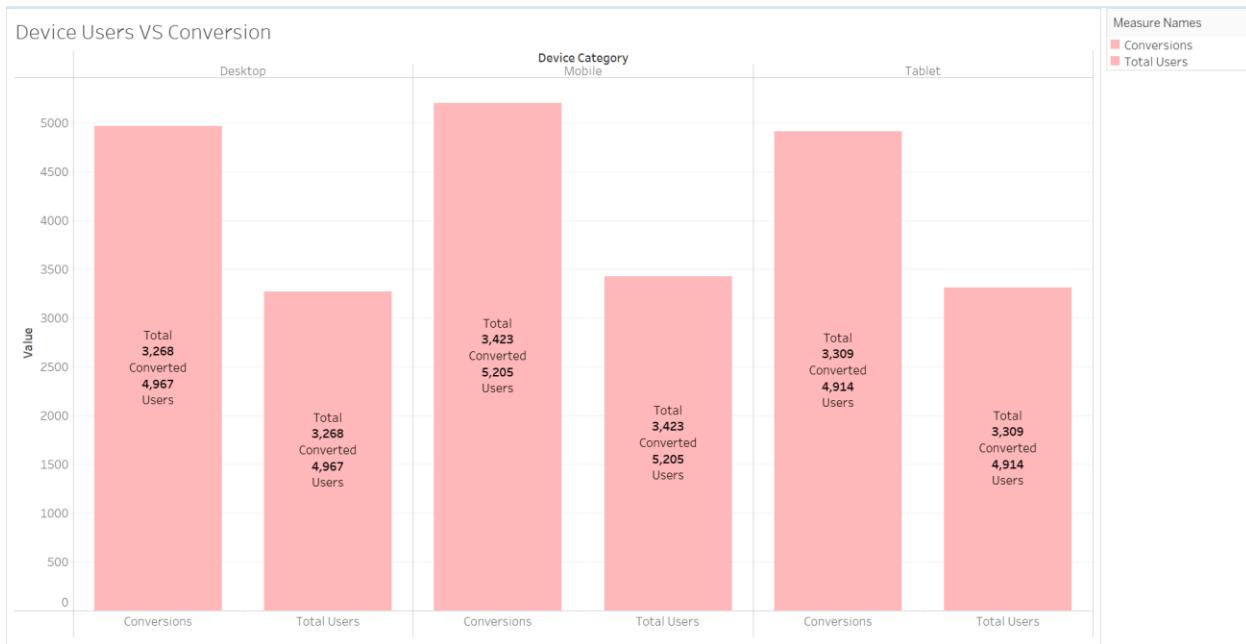
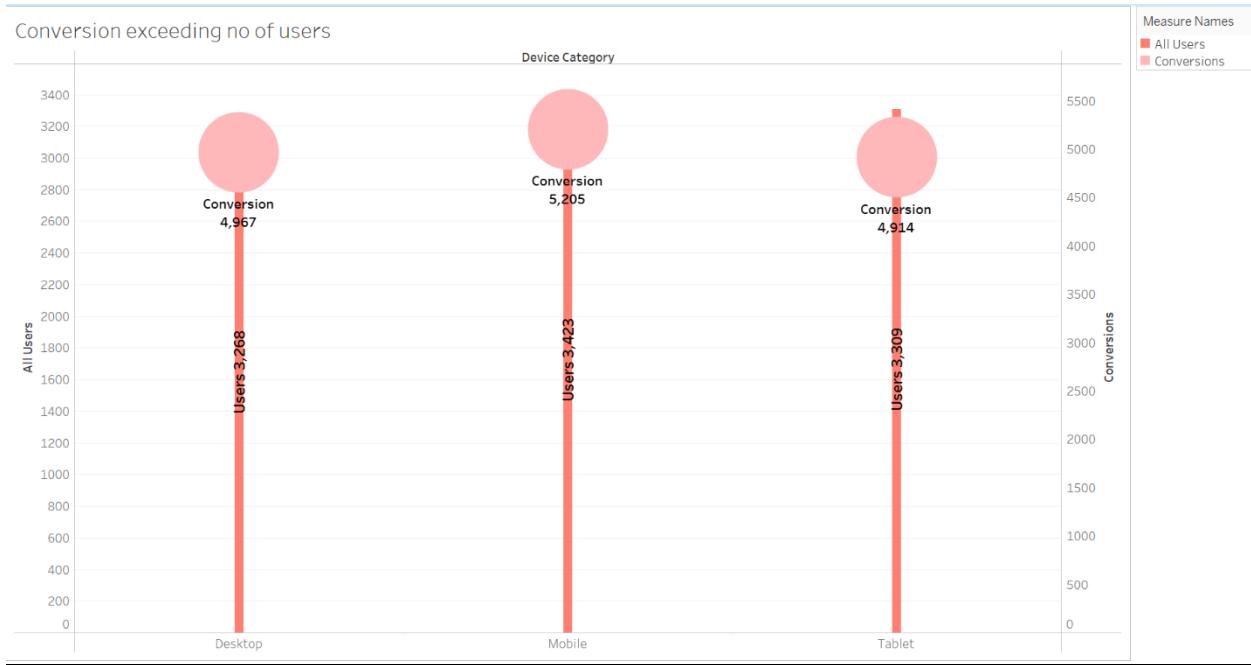


Figure 11: Lollipop chart showing how conversion exceed no of user



Insight: Mobile users are highest, but desktop users show higher conversion than tablets.
Recommend **optimizing tablet UX**.

Dashboard & Storytelling

- Combined individual sheets into a **Tableau dashboard** for stakeholders
- Created a **Tableau story** to narrate insights sequentially

Figure 12: Tableau Dashboard

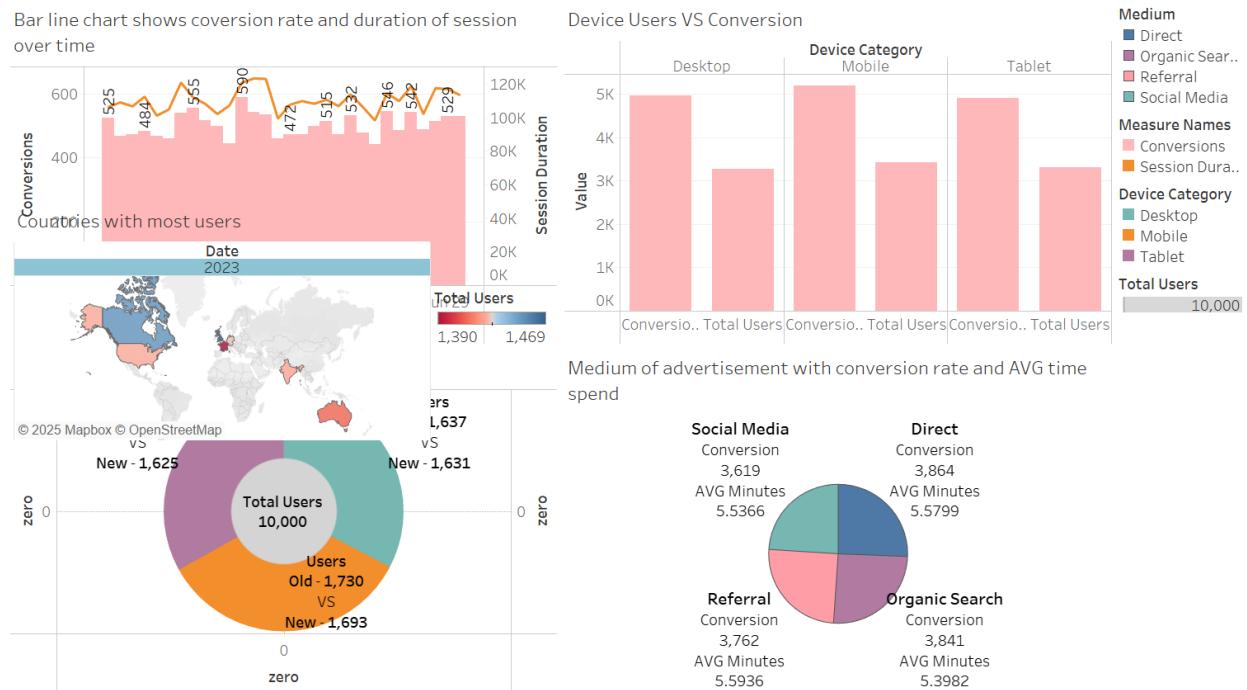
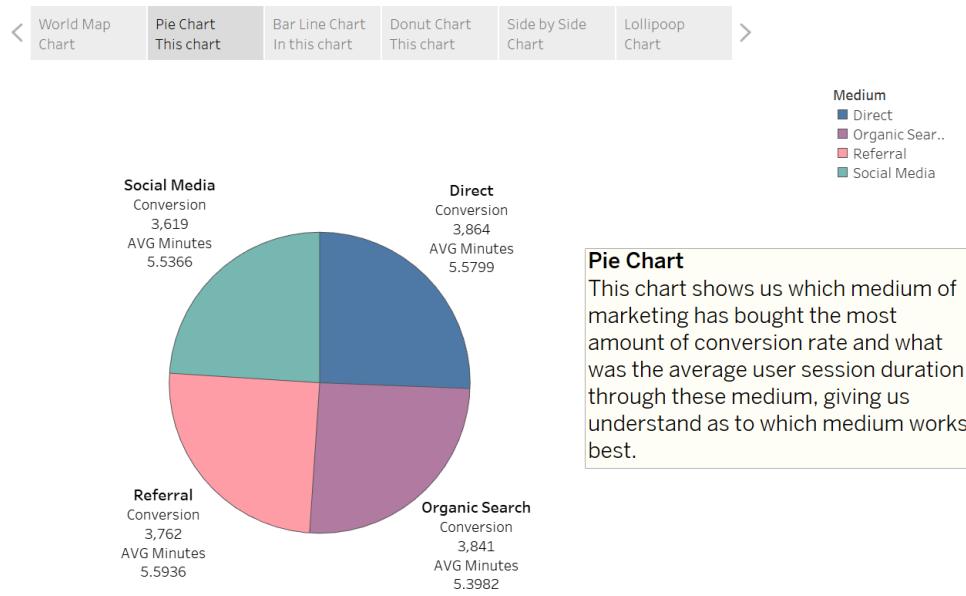


Figure 13: Tableau Story

Story A



Link to Tableau Dashboard and Story:

https://public.tableau.com/views/DashboardA_17499256505320/DashboardA?:language=en-US&:sid=&:redirect=auth&:&display_count=n&:&origin=viz_share_link

https://public.tableau.com/views/StoryA_17499256830070/StoryA?:language=en-US&:sid=&:redirect=auth&:&display_count=n&:&origin=viz_share_link

Conclusion & Recommendations

- Target **France, Germany, UK** for advertising to improve market share
- Enhance **tablet user experience** to increase conversions
- Increase website **engagement** to maximize session duration which may lead to higher conversion
- Use **historical user behavior** for personalized recommendations
- Invest in channels with **proven conversion efficiency** (direct, organic, referral, social)

This project demonstrates skills in:

- Data cleaning and preparation using Python
- Descriptive analytics with Tableau
- KPI-driven insights
- Dashboard and story visualization for stakeholder communication
- Translating data into actionable business strategy