Project Report on
Twitter Analytics Dashboard-Power BI

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Introduction

In today's digital era, Twitter has become one of the most powerful social media platforms for individuals, businesses, and organizations to share opinions, market products, and engage with global audiences in real-time. With billions of tweets being posted every month, analyzing Twitter data can provide deep insights into user behavior, engagement patterns, content effectiveness, and public sentiment.

However, the raw data collected from Twitter is vast, unstructured, and rapidly changing. Extracting meaningful insights from this data requires more than just spreadsheet analysis—it needs advanced visualization and analytical capabilities. This is where **Power BI** comes into play. Power BI is a powerful business intelligence tool by Microsoft that enables users to import, transform, analyze, and visualize data in interactive dashboards. It provides robust support for data modeling, DAX (Data Analysis Expressions), and dynamic filters, making it suitable for handling social media data analytics.

This project is centered around building an intelligent dashboard to analyze Twitter data using Power BI. The primary goal is to uncover patterns in tweet engagement, such as the impact of tweet length, time of posting, and like count. By applying logical conditions and interactive filters, the dashboard highlights specific tweet behaviors—for example, only showing tweets posted during peak hours or those with a certain character count. This kind of targeted analysis helps users make more informed decisions about when and what to post for maximum engagement.

Overall, this project demonstrates the powerful synergy between social media data and business intelligence tools. By using Power BI to explore Twitter engagement data, we bridge the gap between raw data and actionable insights. This hands-on project also builds critical data analysis skills while producing a real-world dashboard that could be used by marketers, analysts, or content creators seeking to optimize their Twitter presence.

Background

Traditionally, social media analytics involved basic metrics like the number of likes, retweets, or followers. However, the field has evolved rapidly, and modern analytics now focus on deeper indicators like **engagement rates**, **audience activity windows**, **content length**, and **interaction timing**. These insights require advanced tools capable of handling complex data relationships and dynamic visualizations—something that spreadsheet tools often struggle with. This gap led to the adoption of business intelligence platforms such as **Power BI** in social media data analysis.

Power BI, developed by Microsoft, allows users to connect to various data sources, clean and transform data, build data models, and create interactive dashboards. It supports advanced **DAX (Data Analysis Expressions) calculations**, enabling the creation of dynamic and custom metrics that go beyond basic aggregations. With Power BI, it's possible to implement time-based filters, rank data based on engagement, and even control the visibility of visuals depending on specific conditions, such as tweet length or time of day.

In this project, Twitter data—such as tweet content, likes, impressions, and timestamps—is analyzed using Power BI to understand engagement trends. The key focus is not only to display data but to **derive insights** from it using filters, rules, and calculated measures. For example, the dashboard highlights tweets with the highest engagement during specific time slots like 3 PM to 5 PM IST. This helps in identifying what kind of content performs best under various conditions.

Activities and Tasks

The project was divided into the following key tasks:

Training Lecture

 Objective : Learned and understood about POWER BI.

 Method: Applied all formulas for transforming the data, understood about visualization. and theory concepts.

Task 1: Filter Tweets Based on Length and Likes

- **Objective**: Display only tweets with <30 characters and >50 likes.
- **Method**: Applied conditional DAX measures and M-Query to flag valid tweets and used filters within visualizations.

Task 2: Display Top 10% Engagement Rates

- **Objective**: Calculated engagement rate and showed only the top 10% of tweets.
- **Method:** Used DAX percentile functions and ranking to isolate top performers and M-query for transforming the data.

Task 3: Time-Based Visualization Control

- **Objective:** Display engagement visuals only between 3 PM and 5 PM IST and hide them outside this window.
- **Method**: Used a DAX measure to check current system time and toggle visual visibility using conditional formatting and a slicer to display a message that the charts will not be available outside the time limit.

Skills and Competencies

Throughout the Twitter Data Analytics project using Power BI, a wide range of technical and analytical skills were developed. One of the foundational skills acquired was **data preprocessing and modeling**. Before any visualizations could be created, the raw Twitter dataset had to be cleaned, formatted, and transformed. Using Power Query, steps like removing null values, converting timestamps to IST, extracting tweet lengths, and categorizing tweets as "Short" or "Long" were carried out.

Another major competency gained was **writing and applying DAX (Data Analysis Expressions)**. DAX is the formula language used in Power BI for creating custom metrics, calculated columns, and dynamic filters.

The top 10% performing tweets using percentile calculations, and implement **time-based logic** for dynamic visual visibility. For example, measures were created to display charts only when **the selected time was between 3 PM and 5 PM IST or to show warning messages when "Other" was selected as a time slot.** These DAX skills are highly transferable and essential for real-world data analysis tasks.

Equally important was the ability to design **user-friendly and interactive dashboards**. Visual elements such as bar charts, line charts, slicers, and cards were not only added for presentation but were carefully structured to answer specific analytical questions. For instance, some visuals showed tweets with the highest engagement filtered by likes and time of day, while others compared engagement patterns between tweets with media and those without. Understanding how to present data visually for maximum impact is a key skill in data analytics and business intelligence.

Power BI allows users to control the visibility or formatting of visuals based on user selections or time-based conditions. This was applied in the project by showing a warning message when the time selected was outside of the allowed window and hiding certain visuals accordingly.

Lastly, the project fostered **soft skills** such as problem-solving, attention to detail, and structured thinking. Encountering issues like syntax errors in DAX, incorrect time zone calculations, or inconsistent data required patience and a methodical approach to debugging. These experiences not only build technical confidence but also prepare learners to handle real-world datasets that are often messy and unpredictable**. Altogether, this project provided a strong foundation in both hard and soft data analytics skills, creating a well-rounded learning experience**.

Feedback

- The dashboard responds dynamically to user selections and displays appropriate warnings when filters or time conditions are unmet.
- Engagement rates have been calculated correctly and are used effectively to isolate the top 10% performing tweets.
- Slicers and filters are designed intuitively, allowing users to segment data by time slots, tweet length, or media presence.
- Time-based visual control using a DAX measure adds an advanced level of logic that simulates real-time dashboard intelligence.
- Potential areas for improvement, which may be highlighted in feedback, could include enhancing visual aesthetics (e.g., color consistency, spacing) or optimizing performance when working with large datasets.

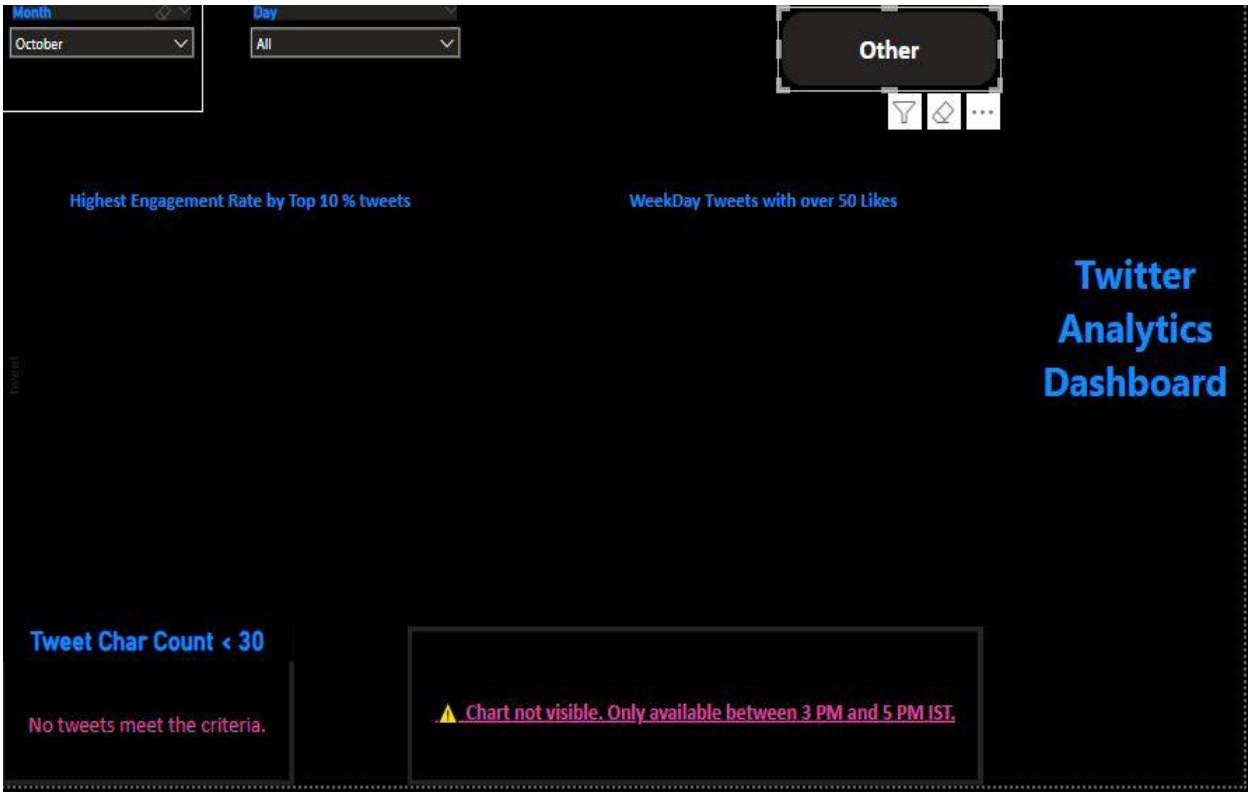
Evidence

1. Training Data

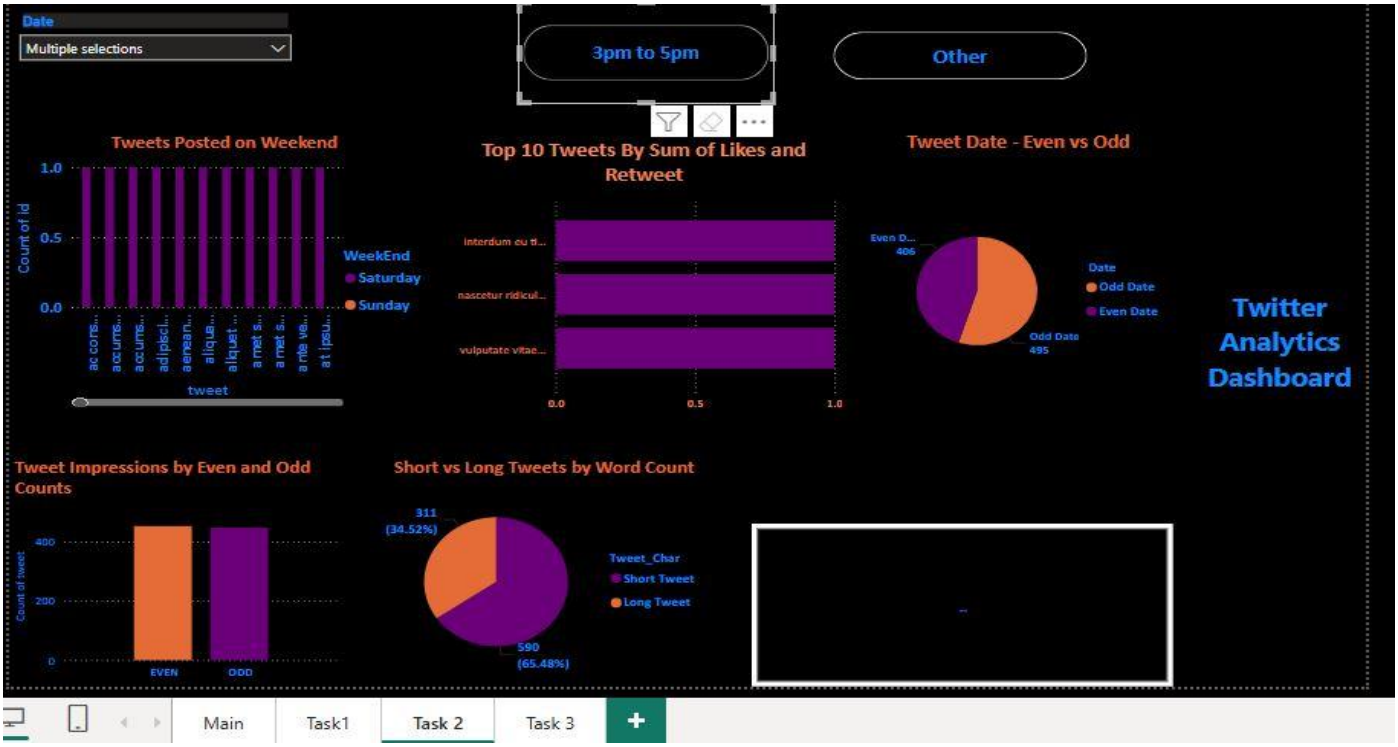
Task 1

Graph time 3pm – 5 pm

After Clicking on Other Time

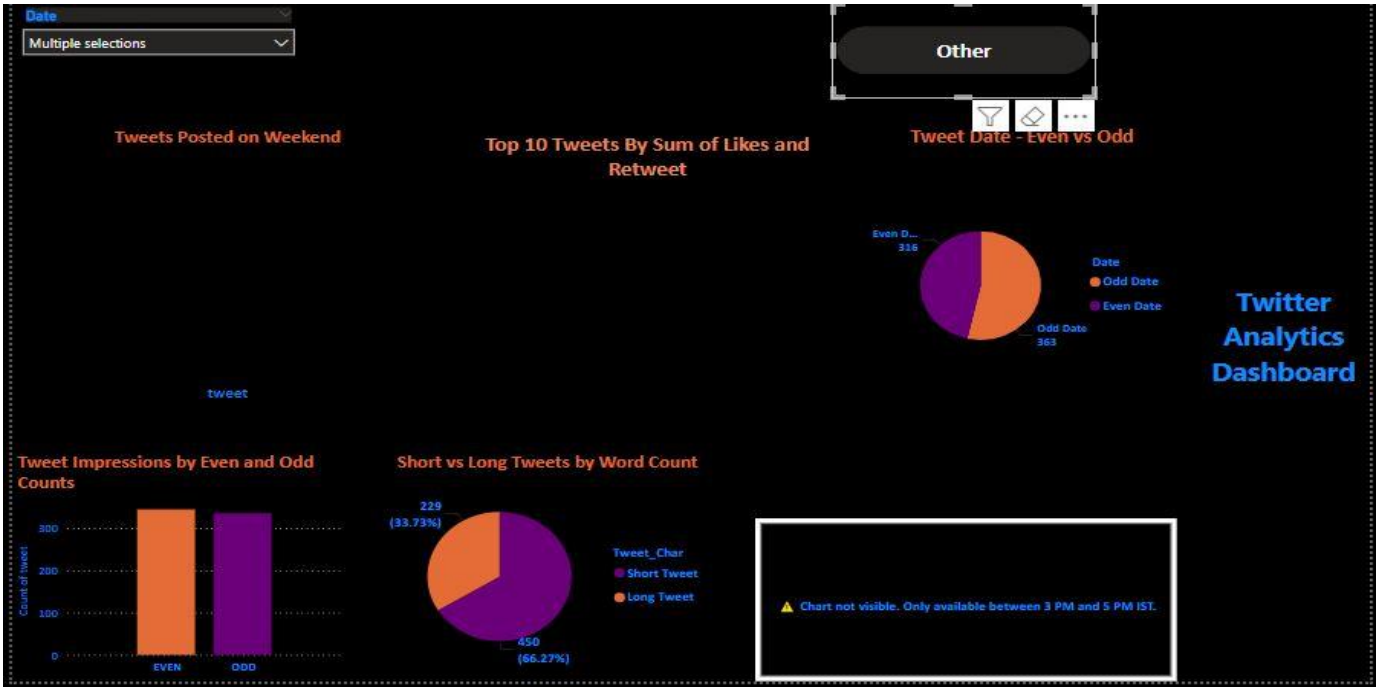


Task -2 :



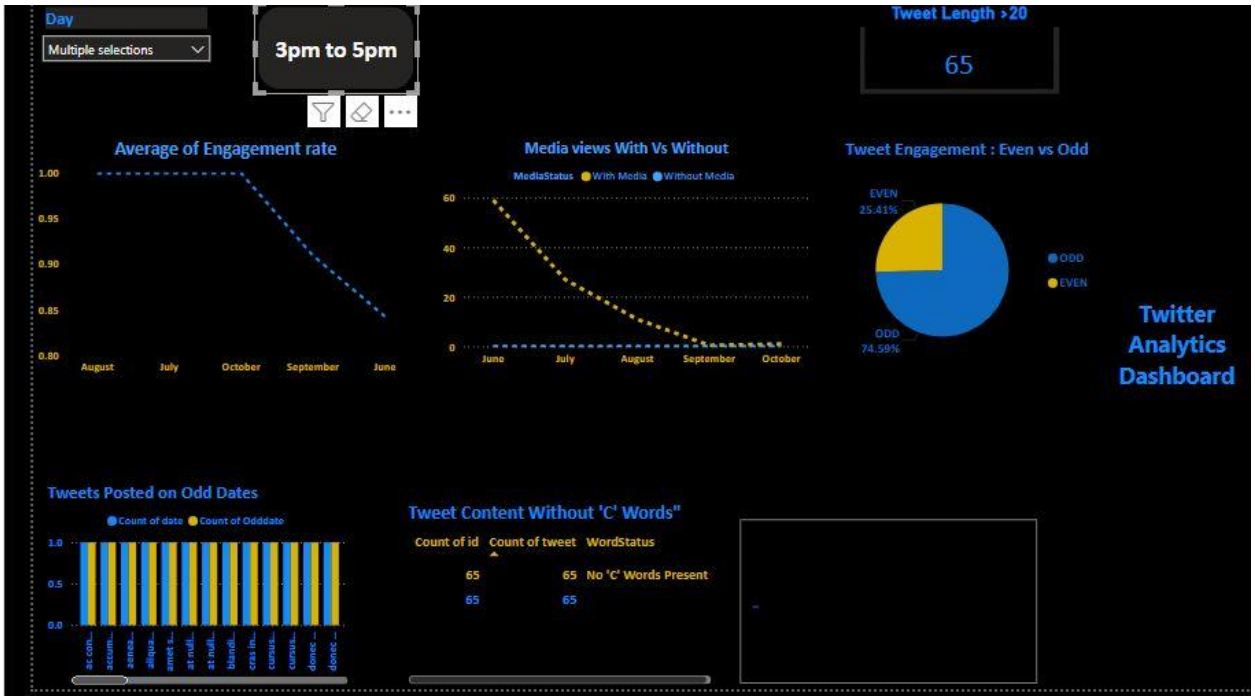
Task-2 Graph Time 3pm-5pm

Task 2: when clicked on other time

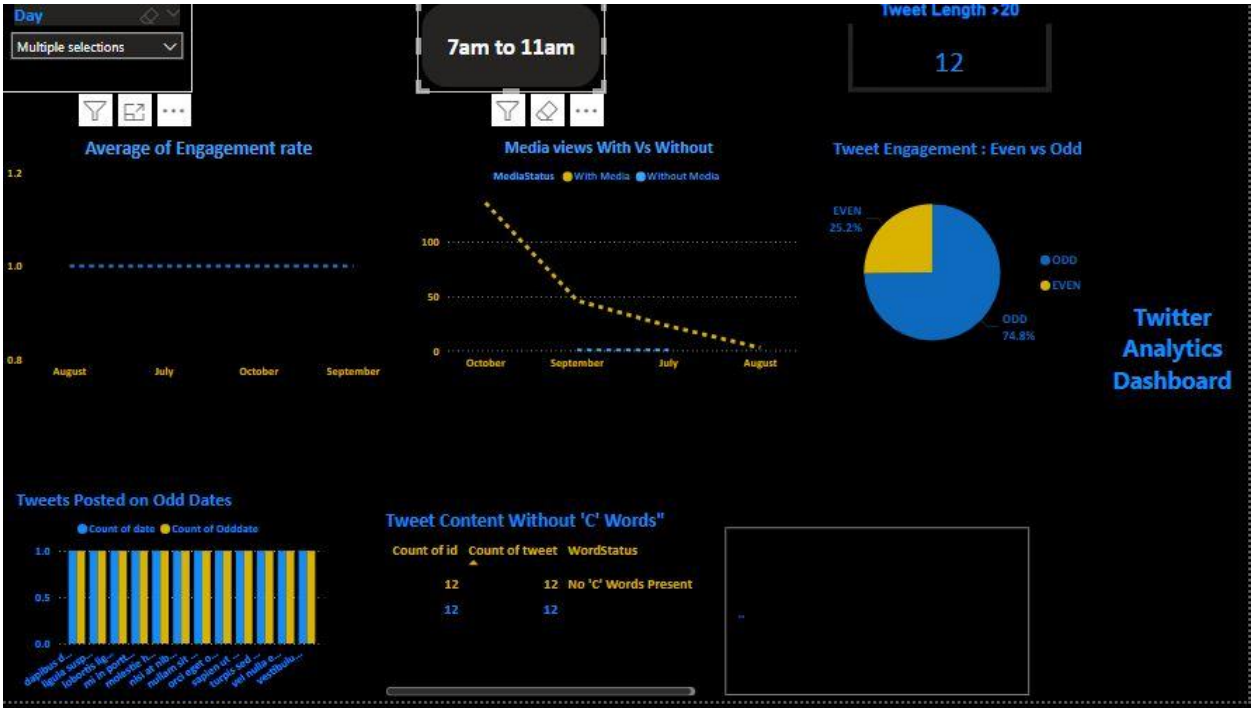


Task 3:

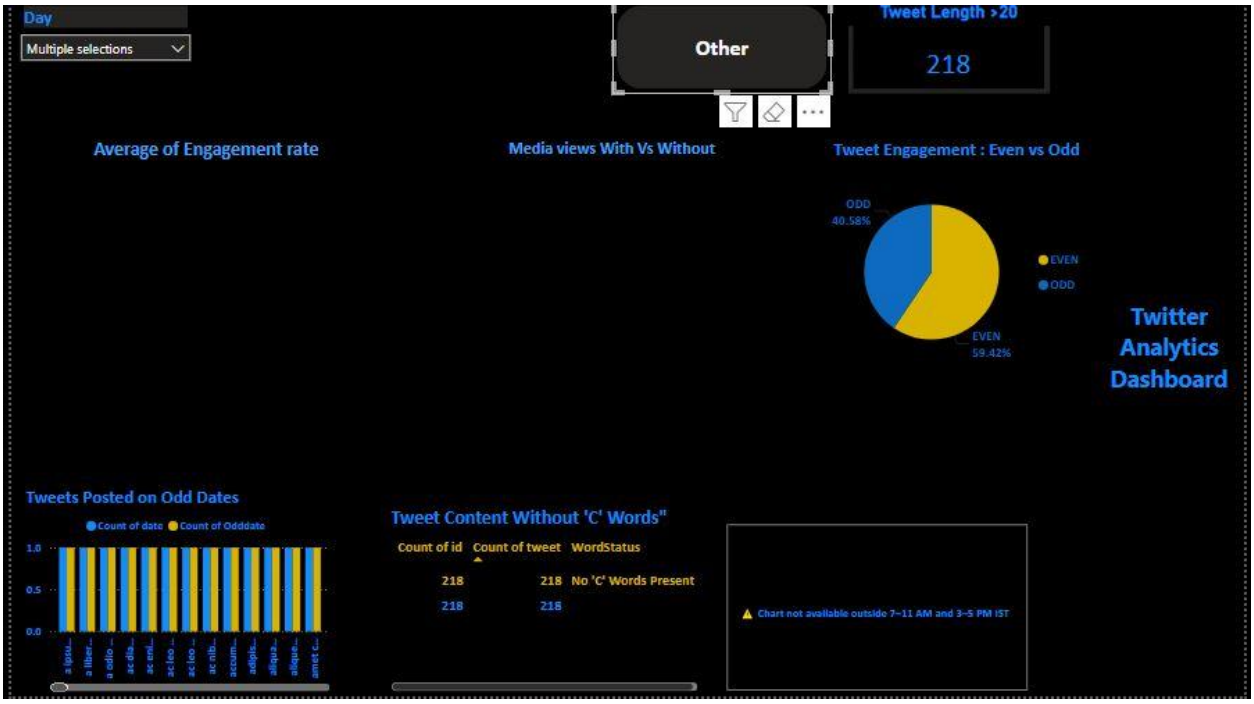
Task 3 – Graph time 3 pm to 5 pm



Task 3- Graph time 7 am to 11 am



Task 3 – When clicked on Other Time



Challenges and Solution

Challenges	Solution
Converting tweet timestamps from UTC to IST	Used Power Query to add time zone conversion logic, adjusting UTC timestamps to Indian Standard Time by **adding +5.5 hours using DateTime.AddZone and Duration**.
Showing a custom warning message when “Other” time is selected	Used a card visual with a DAX measure that displays the message: "Chart not visible. **Only available between 3 PM and 5 PM IST." when “Other” is selected.**
Handling blank visuals when no data matched filters	Added fallback messages using `IF` statements in DAX to avoid blank visuals and guide the user **when no tweets meet the current criteria.**
Ensuring dashboard remains user-friendly and not cluttered	Grouped visuals logically, used minimalistic design and limited the number of slicers visible at one time **for better user experience.**

Outcomes and Impact

The successful completion of the Twitter Data Analytics project using Power BI led to several measurable outcomes and valuable learning impacts.

- **Dynamic Twitter Dashboard Created**

- A fully interactive Power BI dashboard was developed, enabling users to explore tweet data based on various dimensions like engagement rate, likes, impressions, time, and tweet length.

- **Time-Based Visual Filtering Implemented**

- Visuals were programmed to display only between specific time windows (e.g., 3 PM to 5 PM IST) using DAX measures, simulating real-time data-driven decision control.

- **Top 10% Engaging Tweets Identified**

- DAX logic was used to calculate the engagement rate for each tweet and filter out only those in the top 10 percentile, helping identify high-performing tweets.

- **Custom Alerts and Messages Displayed**

- A warning message was created to alert users when an invalid time slot (outside of 3–5 PM) was selected, improving dashboard usability and guiding user interaction.

- **Media vs Non-Media Content Separated**

- The dashboard separated tweets that contained media from those that didn’t, helping evaluate the impact of media on engagement.

Impact

- **Enhanced Analytical Thinking**: Encouraged problem-solving through logic-driven dashboards and filter application.

- **Foundation for Social Media Analytics**: Built a scalable framework for future projects in social media performance monitoring or digital marketing analytics.

- **Presentation & Storytelling Skills**: Improved ability to communicate insights through visuals, titles, tooltips, and contextual messages.

- **Hands-On DAX & M-query Practice**: Strengthened understanding of DAX, especially with logical conditions, time functions, and ranking methods.

Conclusion

This Twitter Data Analytics project using Power BI demonstrated the practical application of business intelligence tools in analyzing and visualizing real-time social media data. Through filtering, conditional logic, and visualization techniques, the project created a dashboard that provides clear and valuable insights into tweet performance.

The outcome is a functional, scalable, and insightful analytics solution that can serve as a foundation for deeper social media analysis

The experience gained through this project directly supports a future career in data analytics and business intelligence, making it a valuable milestone in the journey of becoming a proficient data analyst.

Ultimately, this project has shown how powerful tools like Power BI can be used not just to report data, but to **analyze, interpret, and influence strategic decisions**. In the age of data-driven marketing, such dashboards become crucial for identifying patterns, optimizing campaigns, and measuring audience behavior. The learnings and techniques from this project lay a strong foundation for future work in social media analytics, business reporting, or any field where storytelling through data is key.

In conclusion, the project successfully fulfilled its objective of converting unstructured Twitter data into a structured, insightful, and user-interactive dashboard. It stands as a testament to how analytical thinking, combined with the right tools and techniques, can generate real business value from digital data sources.