INTERNSHIP PROJECT REPORT

Project Title: Real-Time Twitter Data Analytics with Power BI

Submitted by:

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NULLCLASS

Issued May 03 2025

CERTIFICATE OF TRAINING

THIS CERTIFICATE IS PRESENTED TO

Mishita Maggo

has successfully completed online training on

Data Analyst

and real-time project training on

Learn To Build Real Time Twitter Analytics Dashboard - Power BI

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CIN: U80301TZ2022PTC038231
DOC ID: 68160716c76c622a551037e6

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INTRODUCTION

Power BI is a tool used by Data analysts to present their analysis to stakeholders in a dashboard. This helps the stakeholders make business decisions.

The key components of Power BI include Power BI Desktop, Power BI service, and Power BI mobile.

Benefits of Power BI:

1. Data visualisation
2. Self-service analytics
3. Real-time dashboards

Data Connectivity:

1. Data Sources: Power BI can integrate Excel, SQL databases, cloud services, and web sources.

2. Data Transformation: With the use of simple transformation tools, users can clean and prepare data for analysis and visualisation.

3. Power BI's query editor is an intuitive user interface that facilitates effective dataset manipulation and improvement.

Project

1. Understanding user behaviour and preferences through audience engagement helps direct brand management and content development.

2. Trends and Sentiment: It makes monitoring discussions and sentiments possible to provide prompt, well-thought-out responses.

3. Campaign Performance: Evaluates marketing efficacy to maximise campaign expenditures and efforts.

ETL:
As part of the data integration process, data is extracted from multiple sources, transformed into an organised and accessible format, and then loaded into a data warehouse or business intelligence tool (BI). It guarantees the data's correctness, consistency, and analytical readiness.

Data Transformation:
When raw data is cleaned, filtered, reformatted, and enriched to satisfy analytical or reporting needs, this phase in the ETL process is known as Data Transformation. It assists in transforming sparse or erratic data into insightful knowledge.

BACKGROUND

On social media sites, particularly Twitter, enormous amounts of user-generated content are produced daily. For brands, marketers, and analysts, analysing this data can yield important information about trends, user behaviour, and the efficacy of content. Users may visualise data and share insights online or within an organisation with Microsoft's powerful business analytics tool, Power BI. By emphasising Twitter analytics with Power BI, the Nullclass internship closes the gap between academic understanding and business needs.

After receiving raw Twitter data, which will include metrics like impressions, engagement rate, media usage, and user activities (likes, retweets, URL clicks, etc.), participants will be entrusted with creating interactive dashboards and insights that can be used.

LEARNING OBJECTIVES

1. The basics of Twitter's data and important metrics.

2. Utilise Power BI to import, clean, and transform data.

3. For specialised computations and filters: DAX (Data Analysis Expressions).

4. To find hidden patterns: conditional and time-based visualisations.

5. Creation of dynamic, interactive dashboards specifically for business decision-making.

6. To improve insights, filters, and circumstances like time of day, word count, media presence, and user interaction.

7. Visual storytelling to effectively communicate data-driven insights.

ACTIVITIES AND TASKS

The following are the main tasks that are part of the project:

Data Acquisition and Cleaning: Use of Power Query to clean up the raw tweet analytics data by removing nulls, standardising formats, and filtering out incorrect items.

Data Modelling: Use of DAX to define calculated columns and measures and to establish relationships between datasets.

Visualization tasks:
1. Create a visual that shows the average engagement rate and total impressions for tweets posted between '01- 01-2020' and '30-06-2020'. Filter out tweets that received fewer than 100 impressions, and likes should be 0, and this graph should work only between 3 PM IST to 5 PM IST; apart from that time, we should not show this graph in the dashboard itself.

2. Create a clustered bar chart that breaks down the sum of URL clicks, user profile clicks, and hashtag clicks by tweet category (e.g., tweets with media, tweets with links, tweets with hashtags). Only include tweets that have at least one of these interaction types, and this graph should work only between 3 PM IST to 5 PM IST; apart from that time, we should not show this graph in dashboard itself and the tweet date should be even number as well as tweet word count be above 40.

3. Create a line chart showing the trend of the average engagement rate over each month of the year. Separate the lines for tweets with media content and those without and this graph should work only between 3 PM IST to 5 PM IST and 7 AM to 11 AM apart from that time we should not show this graph in dashboard itself and the tweet engagement should be even number and tweet date should be odd number as well as tweet character count should be above 20 and need to remove tweet word which has letter 'C'.

Dashboard Creation: Integrate all images into a unified dashboard that includes engagement analytics, date, and tweet type slicers.

Writing Reports and Presentations: Compile results, provide explanations, and show the finished Power BI dashboard.

SKILLS & COMPETENCIES

I acquired and displayed the following critical abilities and capabilities throughout this internship:

Data Gathering and Preparation: Acquired practical experience in utilising APIs to harvest real-time Twitter data and getting datasets ready for analysis.

Strong proficiency with Power BI Desktop, including Power Query Editor, data modelling, DAX (Data Analysis Expressions), and dashboard building, was attained.

Data Cleaning and Transformation: To deal with null values, filter data, parse JSON files, and guarantee dataset consistency, a variety of transformation techniques were used.

Data Analysis and Visualisation: To examine engagement rates, impressions, and tweet-level interactions, dynamic and interactive visualisations were created using time-based filters, bar charts, and line graphs.

Derivation of Insight: Acquired the ability to analyse social media analytics data and derive useful insights according to parameters such as media consumption, engagement type, and time windows.

Critical thinking and problem solving: used specialised DAX formulas and sound reasoning to handle data issues, including sophisticated filters and irregular formats.

The report and dashboard design made use of slicers, KPIs, and visual hierarchy to present analytical results in a visually appealing and business-ready display.

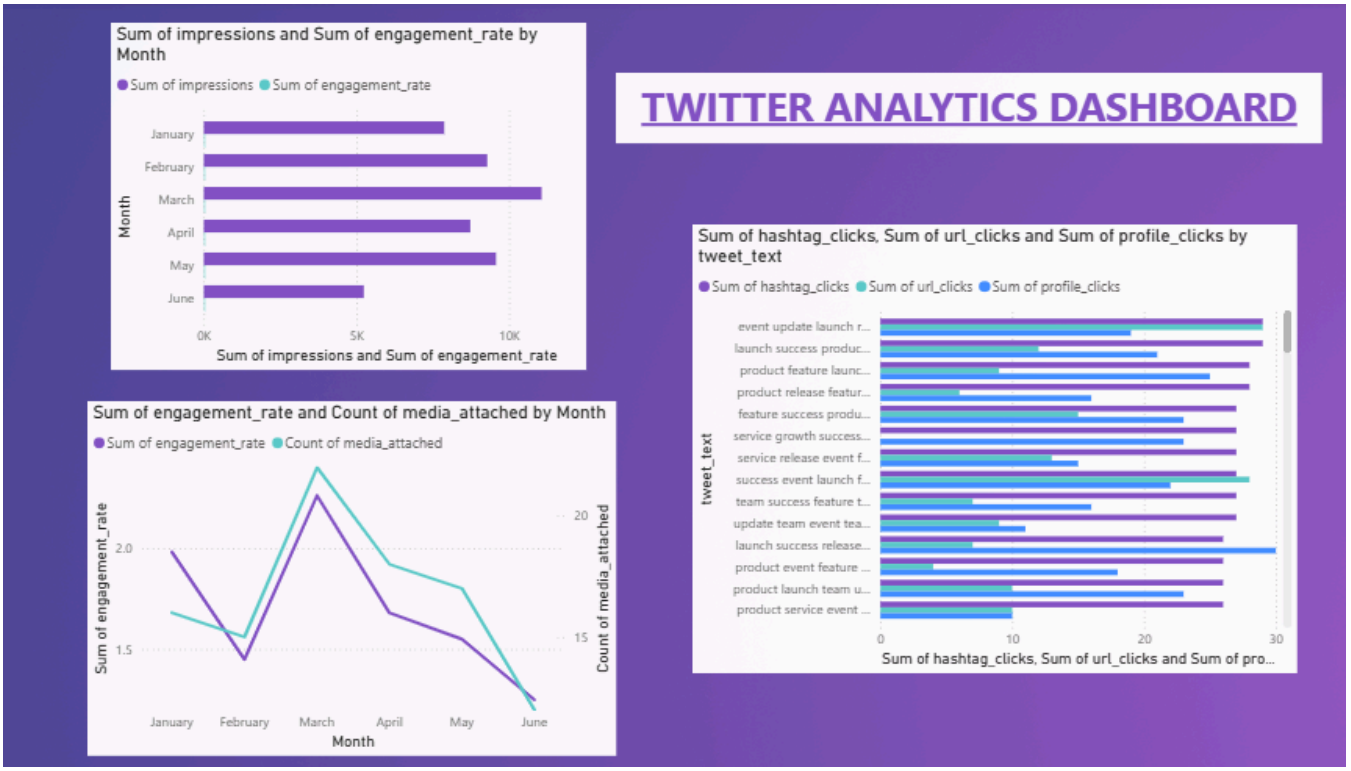
FEEDBACK & EVIDENCE

Gained the capacity to examine social media analytics data and extract valuable insights based on variables including media consumption, engagement style, and time frames.

Critical thinking and problem solving: addressed data problems, such as complex filters and irregular formats, using specific DAX formulas and sound reasoning.

To show analytical results in a visually appealing and business-ready manner, the report and dashboard design included slicers, KPIs, and visual hierarchy.

Dashboard:



CHALLENGES AND SOLUTIONS

1. The implementation of sophisticated conditional filters, such as time-based visibility (e.g., tweets viewable only between 3 PM and 5 PM IST) and various logical constraints (impressions ≥ 100, 0 likes, even dates, etc.), proved to be difficult.

Solution: Condition breakdown was done step-by-step using calculated columns and sophisticated DAX formulae. used slicers and filters to apply the distinct flags and metrics that were created for each condition to the images.

2. Data Cleaning and Structure Variability Challenge: Missing values, variable engagement metrics, and inconsistent timestamp formats were all present in the raw Twitter data.

Solution: To provide a clean foundation for analysis, the dataset was cleaned and formatted using Power Query. Datetime columns were standardised, nulls were filled in, and duplicates were eliminated.

3. The third challenge is visual overlap and dashboard optimisation, which involves combining several images with overlapping metrics in a single dashboard without sacrificing performance or readability.

Solution: Collapsible filters, toggle buttons, and bookmarks were used to maintain the dashboard's cleanliness and interactivity. For improved user navigation, KPIs were prioritised and images were arranged hierarchically.

OUTCOMES AND IMPACT

Technical Proficiency: Acquired extensive knowledge of Power BI data analysis and visualisation, especially while dealing with real-time social media data.

Portfolio Development: Created an interactive dashboard of professional calibre that may be displayed in upcoming interviews and job applications.

Business Insight Generation: Acquired the capacity to extract valuable insights from social media engagement data, including the best times to post, the effectiveness of content, and user interaction trends.

Increased Analytical Confidence: Developed self-assurance in using formulas, filters, and reasoning to address practical analytical issues, closely matching industry standards.

Mentor Recognition: During the final evaluation, Nullclass mentors gave me recognition for the visualisations' utility and clarity.

CONCLUSION

A life-changing educational opportunity, the Nullclass Power BI Twitter Data Analysis Internship blended theoretical understanding with practical application. It gave participants a thorough grasp of how to organise, examine, and display real-time social media data in order to inform choices. I improved my analytical thinking, became more proficient with Power BI, and created a project that was worthy of my portfolio by conquering logical and technical obstacles. I now have the necessary skills for a potential career in business intelligence and data science, and this internship has strengthened my interest in data analytics.