Internship Report by Sai Sreeja

For "*Build Real-Time Twitter Analytics Dashboard using Power BI - 2*"

Introduction

Through this internship, I created a real-time Twitter Analytics Dashboard using Power BI. Its ultimate objective will be to obtain informative conclusions in the form of analysis of major metrics such as tweet interactions, impressions, clicks, and social media insights of other types.

The main focus is to undersatnd how Power bi works and enable better decision-making through interactive and visually dynamic dashboards.

Background

The data set 'SocialMedia.csv' contains several performance metrics such as engagements, retweets, hashtag clicks etc. This helps us, identifies the most engaging content, and provides a drill-down analysis of engagement metrics. The tasks included complex conditional visualizations, the application of filtering logic, and the transformation of raw data into actionable insights.

Learning Objectives

- Understanding Power BI
- Creating and visualising complicated datasets in Power BI.
- Using Power BI filters to create interactive dashboards.
- Customising visualizations using time-based, conditional, and column-specific logic.
- Improving report design and user experience in Power BI.

Activities and Tasks

<u>First Dashboard-</u>

1. Tweet Performance Analysis

Goal: Display the total number of tweets and analyze engagement trends by week.

Implementation:

1. Created a **line chart** showing tweet counts per day of the week.
2. Applied a time-based filter to analyze weekly trends.
3. Highlighted peak engagement days using conditional formatting.

2. Impressions and Engagement Rate Visualization

Goal: Measure impressions and engagement rates across different timeframes.

Implementation:

1. Developed a **dual-axis chart** to compare impressions and engagement rates.
2. Filtered data by specific time periods to observe fluctuations.
3. Applied conditional formatting to highlight high-performing periods.

3. URL Clicks by Tweet

Goal: Identify tweets that generated the most URL clicks

Implementation:

1. Created a **bar chart** displaying tweets ranked by URL clicks.
2. Applied sorting and filtering to highlight the top-performing tweets.
3. Enabled drill-through functionality to explore individual tweet metrics.

4. Tweet Count by Day

Goal: Analyze the distribution of tweets across different days of the week.

Implementation:

1. Created a bar chart displaying the number of tweets for each day.
2. Identified trends in tweet activity and peak posting days.
3. Applied filters to analyze specific timeframes for deeper insights.

5. URL Clicks by Tweet

Goal: Identify tweets that generated the most URL clicks

Implementation:

Created a **bar chart** displaying tweets ranked by URL clicks.

Applied sorting and filtering to highlight the top-performing tweets.

Enabled drill-through functionality to explore individual tweet metrics.

6. Total Clicks Distribution

Goal: Analyze the total number of clicks on tweets and their distribution.

Implementation:

1. Created a pie chart to show the percentage distribution of clicks across different tweets.
2. Identified high-performing tweets based on click-through rates.
3. Applied interactive filtering for better insights.

Second Dashboard

1. Pie chart with drill-down for clicks.

Goal: Display the proportion of URL clicks, user profile clicks, and hashtag clicks on tweets with more than 500 impressions, with the option to dig down to single tweet clicks.

Implementation: Filtered tweets with more than 500 impressions.

1. Clicks by category are shown by a pie chart, which includes URL clicks, user profile clicks, and hashtag clicks.
2. Drill-down functionality was implemented at each level using Tweet ID.
3. Configuring interactivity so that viewers may view specifics about a certain tweet by clicking the chart.

2. Bar Chart for Top 10 Tweets with Retweets and Likes

Goal: Show the top 10 tweets by the sum of retweets and likes, excluding tweets posted on weekends, filtered further by specific conditions.

Conditions Applied:

1. Tweets with even impressions, odd dates, and word counts under 30.
2. Excluded tweets posted on weekends by dragging the "Week" parameter into the filters and deselecting it.

Implementation:

1. To achieve "Total Engagement," I created a calculated column that totalled retweets and likes.

2. Filtered the logic for both circumstances at the same time using Power BI's filtering interface.
3. Added a user profile feature to the bar chart to indicate whose account each tweet is from.

3. Media Views and Engagements - Dual-Axis Chart

Goal: Compare media views and media engagements by day of the week for tweets in the last quarter, highlighting days with significant spikes.

Conditions Applied:

1. Even-numbered impressions, odd-numbered dates, character counts more than 30, and tweets starting with the letter "H" were eliminated.

Implementation:

1. Used a dual-axis line and bar chart to compare media views and engagements daily.
2. Used conditional formatting and labels to highlight peaks in media interaction.
3. Filtered last-quarter data using the "Quarter" column rather than Power BI's relative time filter.

Skills and Competencies

Data Modeling: Turned raw data into meaningful structures using calculated columns and measures in Power BI.

DAX (Data Analysis Expressions): Applied conditional filters such as impressions, dates, time periods, word counts, and content exclusion.

Advanced Visualization: Used dynamic charts and filters to create a real-time dashboard.

Data Interactivity: Added drill-downs and conditional visibility for time-sensitive charts to improve user experience.

Challenges and Solutions

Technical and conceptual points were posed that called for a depth of understanding in business requirements, creative problem-solving capabilities, and technical expertise. General challenges and approaches taken are presented below:

1. Data cleansing and preparation

Problem: Raw data typically contains errors, superfluous columns, and missing values, making it difficult to glean significant insights. In addition, the data format may not meet the Power BI modelling criteria.

Solution: Used data preparation techniques to clean and format data properly. This includes creating computed columns and measures to enforce the application's business rules. Relationships between tables were optimised to ensure that the data model was always stable and performant.

2. Complex Filtering Needs

Problem: Business-specific filtering constraints, such as time periods, precise property values (for example, even impression counts), and exclusions, may necessitate complicated reasoning to avoid inaccurate conclusions or overlapping conditions.

Solution: Use the built-in Power BI filter settings. filter options alongside advanced DAX expressions like FILTER, IF, OR, and MOD to apply precise logic. Filters were layered efficiently to allow seamless interactivity without conflict.

3. Interactive and conditional charts.

Problem: Needed to update in real time based on user requests, such as appearing just within a specific time range or even colour-coding particular days of high involvement.

Solution: To impact behaviour, combine computed metrics, complex filters, and conditional formatting. This contributed to the dashboard's dynamic while also improving its usability.

4. User Interactivity and Drill-down

Problem: The dashboard structure has to strike a balance between complexity and simplicity, providing enough data for decision-making.

 Solution: Created graphics with drill-down and tooltip features to allow users to explore additional information without cluttering the primary interface. Grouped relevant facts into simple forms and utilised interactive filtering to improve the

5. Managing performance constraints

Problem: Large amounts of data and filters in Power BI dashboards cause the graphics to load slowly or become unresponsive.

Solution: We simplified the data model by deleting unneeded columns, pre-aggregated when possible, and optimised DAX queries for speed. This approach ensured responsiveness even with complicated filters and large datasets.

Results and Consequences

1. Created an interactive and adaptable real-time Twitter analytics dashboard.
2. Key metrics were highlighted, including top-performing tweets, click distribution, and engagement trends by day of the week.
3. Users may now gain straightforward and actionable insights thanks to interactive filters and visual customisations.
4. I learnt how to utilise conditional logic in business intelligence tools, which improved my data analysis skills.

Conclusion

Through this internship i was able to go further into data analytics with Power BI. I was able to develop and customise dashboards to deliver useful information. The project displayed my ability to handle complicated datasets, visualisations, and dynamic situations. The learnt abilities will greatly benefit my profession in data analysis and business intelligence.

Submitted by-

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