NullClass Internship Report for Task 3

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Introduction

In the age of digital communication, social media platforms have emerged as powerful tools for engagement, marketing, and brand building. These platforms provide businesses and individuals alike with the ability to connect with large, diverse audiences in real-time. With such vast engagement opportunities, there is an increasing need to analyze social media data effectively. Insights from this analysis help to understand user behavior, measure the effectiveness of content, and optimize future strategies.

During my internship, I was assigned a task to develop a dual-axis chart showing media views and media engagements by the day of the week for the last quarter. The chart was intended to highlight days with significant spikes in media interactions, with filtering conditions that restricted the data to times between 3 PM and 6 PM and only included tweets with even impressions, odd tweet dates, and tweet word counts below 30. I used a variety of Power BI tools, such as cards to display the sum of media engagements and views, a slicer for filtering days of the week, and a range of charts, including a line chart, line and stacked column chart, clustered bar chart, and line and clustered column chart. This task taught me valuable skills in data visualization and filtering, allowing me to identify key spikes in engagement.

Background

Social media analytics has become essential for organizations and individuals seeking to measure the effectiveness of their online content. Twitter, being a platform with global reach, generates data at an enormous rate, which requires tools like Power BI to analyze and derive insights. Tracking engagement rates, such as likes and retweets, is crucial in understanding which tweets perform best and why. This helps in identifying trends, improving content strategies, and engaging more effectively with the target audience.

The background of this internship stems from the growing significance of data analytics in the field of social media. Companies are becoming increasingly reliant on data-driven decisions, especially when it comes to improving their online presence and user engagement. Social media platforms generate a tremendous amount of data in the form of likes, shares, comments, and views. This data, if effectively analyzed, can provide insights into trends and user behavior.

During my internship, my main task was focused on visualizing this kind of data, specifically media views and engagements over time. The task required not only the ability to create effective visualizations but also to use specific filters to make the data more meaningful. This context provided me with the opportunity to work hands-on with real-time data and understand how businesses can leverage such information for decision-making purposes.

Learning Objectives

The primary learning objective of this task was to apply advanced data analysis techniques using Power BI, with a focus on building dynamic and interactive dashboards. By completing this task, I sought to strengthen my skills in several key areas, including:
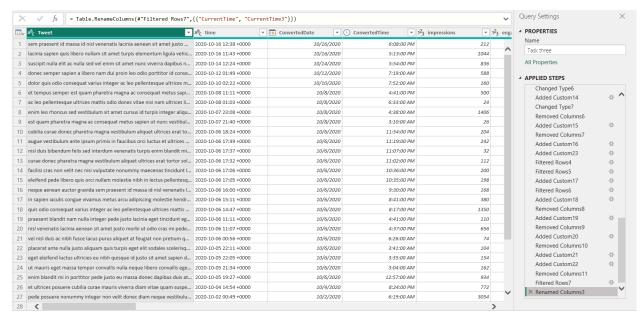
1. **DAX Formulas and Logic:** The primary learning objective was to enhance proficiency in writing complex DAX formulas for filtering and calculating metrics. This involved creating calculated columns and measures to meet specific conditions such as even tweet impressions, odd tweet dates, and tweet word counts below 30. Mastering DAX was crucial for achieving real-time interactivity and precision in the dashboard, enabling accurate data analysis and meaningful insights.
2. **Real-Time Data Handling:** Another objective was to develop skills in managing real-time data constraints. The dashboard needed to function only between 3 PM and 6 PM, necessitating dynamic solutions that responded to the system's local time. This involved creating measures to filter data based on time windows, which was essential for building a time-dependent dashboard that effectively reflects current data trends.
3. **Visualizing Data:** Choosing and applying appropriate visualizations was a key objective. The task required selecting the right chart types (e.g., clustered bar charts, line charts) to present media views and engagements. The goal was to design visuals that could effectively highlight significant spikes and trends, making it easier to interpret social media engagement data and draw actionable conclusions.
4. **Applying Filters:** Gaining expertise in applying filters within Power BI was another important objective. This involved filtering tweets by likes, word count, impressions, and day of the week to focus on relevant data. Learning to implement these filters intuitively was crucial for generating precise insights and enhancing the overall functionality of the dashboard.

Activities and Tasks

The task began with data cleaning and preparation, where I filtered the dataset to include only tweets with even impressions, odd dates, and word counts below 30. This process involved creating calculated columns and measures using DAX to accurately capture these conditions. I developed a custom column to count tweet words and filtered the dataset to ensure it met the specified criteria.

Next, I focused on building the dual-axis chart, which required plotting the number of media views and media engagements by the day of the week for the last quarter. To achieve this, I used the "DayWeek" column for the x-axis and applied aggregation functions to summarize media views and engagements. I created a line and stacked column chart to visualize these metrics, enabling a clear comparison of media views and engagements across different days of the week.

To enhance the dashboard, I incorporated additional visualizations: a line chart with media views and engagements on secondary y-axes, a clustered bar chart comparing maximum media engagements and views, and a line and clustered column chart for a detailed view of spikes. I used KPI cards to display the sum of media engagements and views prominently.

Finally, I addressed time-based filtering by ensuring the dashboard only displayed data between 3 PM and 6 PM. I applied a slicer to focus on specific days of the week and used conditional formatting to highlight significant spikes in media interactions, providing a clear and interactive representation of the data.

This comprehensive approach ensured that the dashboard was dynamic, interactive, and tailored to the specified conditions, effectively showcasing media interactions and highlighting key insights.

Skills and Competencies

This task honed a variety of technical and analytical skills essential for a career in data analytics:

1. **Advanced Power BI Skills:** The task significantly enhanced my skills in Power BI, particularly in crafting complex DAX queries and creating responsive dashboards. I learned to handle intricate conditions and multi-level filters, which improved my ability to work with real-time data and build interactive visualizations. This experience deepened my understanding of Power BI tools and functionalities.

2. **Data visualization:** Creating effective visualizations was a major focus, improving my ability to select and apply appropriate chart types for representing data. I learned to design visuals that communicated trends and significant spikes, enhancing my capability to present complex data in a comprehensible and impactful way.

3. **Time-Based Filtering:** Developing time-based filtering skills was essential for the task. I learned to create dynamic features that responded to system time, enabling the dashboard to function within specified time windows. This skill is valuable for building dashboards that need to adapt to real-time constraints and provide accurate, time-sensitive insights.

4. **Problem Solving and DAX:** The task required robust problem-solving skills to address issues with DAX formulas, including type mismatches and logic errors. Debugging these

issues and finding solutions enhanced my analytical capabilities and patience, which are crucial for resolving complex problems in data analysis.

5. **Project Management:** Managing multiple aspects of the dashboard project taught me effective project management techniques. I learned to structure and execute a data analytics project from start to finish, breaking down complex requirements into manageable tasks and ensuring successful project completion.

Feedback and Evidence

Since I undertook this task independently, there was no formal feedback provided by a supervisor or mentor. The entire process—from planning to implementation—was self-driven. I encountered several challenges, particularly with the time-based functionality, but through trial and error, I was able to develop effective solutions. This task was a valuable exercise in self-assessment and problem-solving, as I had to rely on my judgment to determine the effectiveness of the visualizations and the accuracy of the filters.

Despite the lack of external feedback, I took proactive steps to evaluate the success of the task. For instance, I continuously tested the dashboard under various conditions (different times of the day, filtering out tweets, etc.) to ensure all components worked as expected. After several iterations, I implemented a robust solution that dynamically updated the dashboard based on system time and other filtering criteria.

Evidence of my work includes the completed Power BI file, which features fully functional filters, time-based constraints, and accurate visualizations. I also captured screenshots at various times during the day to demonstrate how the dashboard transitioned between "Active" and "Inactive" states based on system time. Through this process, I gained valuable hands-on experience, further improving my technical proficiency in Power BI and data analytics.

Challenges and Solutions

One of the main challenges was filtering the dataset according to specific conditions such as even tweet impressions, odd tweet dates, and word counts below 30. Crafting intricate DAX formulas and handling data type discrepancies were crucial. Additionally, implementing time-based functionality to ensure the dashboard operated only between 3 PM and 6 PM required dynamic filtering solutions. To address these challenges, I conducted extensive research on Power BI functionalities and DAX techniques, developing custom columns and measures to meet the filtering requirements. Iterative testing and refinement of the dashboard ensured that the solutions were accurate and effective in visualizing spikes and trends.
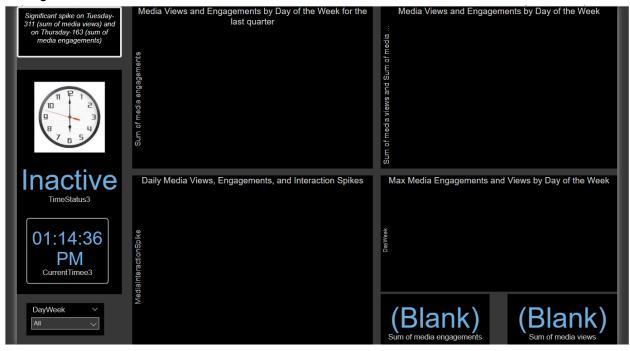
Outcomes and Impact

The completion of the dual-axis chart task demonstrated my ability to handle complex data analysis and visualization tasks. By creating a dual-axis chart showing media views and engagements by day of the week for the last quarter, I provided a detailed view of social media metrics. The task required filtering the dataset to meet specific conditions—tweets with even impressions, odd dates, and word counts below 30—ensuring that the data presented was relevant and insightful.

The visualizations, including the line and stacked column chart, a line chart with dual y-axes, and a clustered bar chart, effectively highlighted significant spikes in media interactions. This allowed for a clear understanding of how media engagement varied across different days of the week. The use of cards to display aggregate values further emphasized key insights.

By focusing on the specified time window of 3 PM to 6 PM and applying precise filters, the dashboard offered actionable data that can help organizations tailor their engagement strategies.

The impact of this task extends to providing valuable insights for optimizing social media strategies. The ability to highlight spikes in interactions facilitates targeted decision-making and enhances the effectiveness of social media campaigns.

Conclusion

The task of creating a dual-axis chart to show media views and media engagements by day of the week for the last quarter was completed with precise data handling and advanced Power BI techniques. By filtering tweets to meet specific conditions—such as even impressions, odd dates, and word counts below 30—the analysis was tailored to highlight meaningful patterns. The dual-axis chart, complemented by other visualizations like the line and stacked column chart, line chart with dual y-axes, and clustered bar chart, effectively highlighted significant spikes in media interactions. KPI cards provided clear, aggregated metrics, enhancing the dashboard's usability. Managing the dashboard's functionality to operate only between 3 PM and 6 PM added complexity, which was addressed through dynamic time-based filtering.

This task demonstrated my ability to use Power BI for complex data analysis and visualization, providing actionable insights into social media engagement patterns. The visualizations created support data-driven decision-making and strategic adjustments for improved social media strategies. Overall, this task reinforced my skills in data analysis and visualization, showcasing the impact of well-executed data management and analysis.