Internship Report: Learn To Build a Real-Time Twitter Analytics Dashboard - Power BI

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Internship Position/Title: Data Analyst Intern

Company: Null Class

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1. Introduction

This report outlines the activities and outcomes of my internship project, which focused on the end-to-end development of a dynamic performance dashboard using Microsoft Power BI. The project involved transforming a raw social media dataset into an interactive, user-friendly, and insightful analytical tool. The final dashboard provides a comprehensive overview of social media engagement metrics, designed to support data-driven decision-making.

2. Background

The project was initiated to address the need for a clear and automated way to analyze social media performance. The existing process relied on static data, making it difficult to identify trends, understand audience behavior, and measure content effectiveness in real-time. The goal was to create a centralized dashboard that could provide actionable insights into key performance indicators (KPIs), content strategy, and audience engagement patterns.

3. Learning Objectives

- To master the data transformation and modeling capabilities of Power Query and Power BI.
- To develop proficiency in writing complex Data Analysis Expressions (DAX) for custom calculations and business logic.
- To apply best practices in data visualization and dashboard design to create an intuitive user experience.
- To implement advanced features, such as conditional visibility and interactive filtering, to enhance dashboard functionality.

4. Activities and Tasks

The core of the internship involved building a multi-faceted dashboard with six primary analytical visuals:

- Scatter Chart Analysis: Plotted the relationship between media views and engagements, highlighting high-performance tweets.
- Click-Type Breakdown: Developed a clustered bar chart to compare URL, profile, and hashtag clicks across different tweet categories.
- Top Content Identification: Built a bar chart to rank the top 10 tweets by the sum of retweets and likes, excluding weekend posts.
- Trend Analysis: Created a line chart showing the average engagement rate trend by month, separating tweets with and without media.
- Engagement Comparison: Visualized a comparison of replies, retweets, and likes for tweets with above-median media engagement.
- Performance by Action: Analyzed the difference in engagement rate for tweets that prompted URL clicks versus those that did not.

A significant feature implemented across all charts was time-based conditional visibility, which made visuals appear and disappear based on predefined business hours.

5. Skills and Competencies

Technical Skills:
- Power Query (M Language): Data cleaning, creating conditional/custom columns, and reshaping data (unpivoting).
- DAX: Writing measures for KPIs, calculated columns, and complex logical functions for filtering and time-based visibility.
- Data Visualization: Selecting appropriate chart types and applying formatting best practices for clarity and impact.
- Power BI Service: Understanding of publishing, refreshing, and managing reports.

Soft Skills:
- Problem-Solving: Systematically debugging DAX formulas, troubleshooting data type errors, and resolving time-caching issues.
- Analytical Thinking: Interpreting business requirements and translating them into technical specifications and effective visuals.
- Attention to Detail: Ensuring data accuracy, consistent design, and flawless execution of complex filtering rules.

6. Feedback and Evidence

Throughout the project, feedback was incorporated to refine the dashboard's usability and analytical value. The primary evidence of this work is the source code (.pbix file) itself,

which has been documented and stored on GitHub. A live version of the report, published to the Power BI Service, serves as the final deliverable.

Evidence: https://github.com/chinthan59/Twitter-Analytics-Dashboard---PowerBI.git

7. Challenges and Solutions

- Challenge: Data reshaping for specific visuals (unpivoting) broke other charts that relied on the original table structure.
  Solution: Adopted the best practice of duplicating the query in Power Query. This isolated the unpivot transformation to a separate table used only for the specific visual, preserving the integrity of the main data model.

- Challenge: Built-in Power Query operators ("is even") failed due to incorrect data types.
  Solution: Developed a more robust custom column formula using Text.End() to check the last digit of a number, bypassing the data type dependency.

8. Outcomes and Impact

The primary outcome is a fully functional, automated, and interactive social media performance dashboard. The dashboard successfully transforms raw data into clear, actionable insights, enabling stakeholders to:

- Quickly assess overall performance via KPI cards.
- Identify top-performing content and optimal posting times.
- Understand audience engagement patterns in depth.
- Make informed decisions to improve social media strategy.

The impact is a significant reduction in manual reporting time and an enhancement of analytical capabilities.

9. Conclusion

This internship project provided an immersive, hands-on experience in the complete lifecycle of business intelligence development. From initial data cleaning to advanced DAX implementation and final dashboard design, the project was instrumental in solidifying my technical skills and analytical thinking. Overcoming the various challenges deepened my understanding of Power BI's nuances and reinforced the importance of structured problem-solving. The final dashboard stands as a testament to the skills learned and is a valuable asset for performance analysis.