

INTERNSHIP REPORT: POWER BI DASHBOARD DEVELOPMENT WITH ADVANCED DATA ANALYTICS

1. INTRODUCTION

This internship report documents the development of an advanced Power BI dashboard for Twitter data analytics. The project involved creating six complex visualizations with dynamic time-based filtering, conditional logic implementation, and sophisticated data analysis techniques. The dashboard was designed to provide insights into tweet engagement patterns, user interactions, and content performance metrics with real-time visibility controls based on Indian Standard Time (IST).

2. BACKGROUND

The project focused on analyzing Twitter engagement data through multiple visualization techniques. The dataset contained comprehensive tweet metrics including engagement rates, media interactions, user profile clicks, hashtag performance, and temporal data. The challenge was to create a responsive dashboard that would display different visualizations based on current time, implementing complex business rules for data filtering and presentation. This approach simulates real-world business intelligence scenarios where dashboards need to show relevant information based on operational hours and specific criteria.

3. LEARNING OBJECTIVES

The primary learning objectives for this internship were:

- Master advanced Power BI formula construction using nested conditional logic
- Implement time-based dynamic filtering for dashboard visibility control
- Develop complex data aggregation and filtering techniques
- Create multiple visualization types for comprehensive data analysis

- Build responsive dashboards with real-time conditional display logic
- Apply mathematical operations for data categorization (odd/even number filtering)
- Integrate string manipulation for content filtering (letter exclusion rules)

4. ACTIVITIES AND TASKS

Task 1: Scatter Chart Analysis - Developed a scatter plot analyzing media engagements versus media views, implementing filters for replies >10, engagement rate >5%, odd tweet dates, and word count >50, with 6PM-11PM IST visibility window.

Task 2: Clustered Bar Chart - Created interaction breakdown visualization for URL clicks, profile clicks, and hashtag clicks by tweet category, filtered for even tweet dates, word count >40, with 3PM-5PM IST display time.

Task 3: Top 10 Rankings - Built ranking visualization for top tweets by combined retweets and likes, excluding weekends, filtering for odd tweet dates, even impressions, word count <30, active 3PM-5PM IST.

Task 4: Trend Line Analysis - Constructed monthly engagement rate trends comparing media vs non-media tweets, implementing dual time windows (3PM-5PM & 7AM-11AM IST), with letter 'C' exclusion and character count >20 filters.

Task 5: Comparative Analysis - Developed visualization comparing replies, retweets, and likes for high-engagement tweets (above median), targeting June-August 2020 data with complex filtering criteria.

Task 6: App Opens Comparison - Created engagement rate comparison for tweets with/without app opens during business hours, implementing multiple time windows and sophisticated filtering logic.

5. SKILLS AND COMPETENCIES

Technical Skills Developed:

- Advanced DAX formula construction with nested AND/OR logic

- Time-based conditional formatting and visibility controls
- Complex mathematical operations implementation (MOD functions, integer divisions)
- String manipulation and pattern matching techniques
- Multi-criteria data filtering and aggregation
- Dynamic measure creation and calculation optimization

Analytical Competencies:

- Data pattern recognition and trend analysis
- Statistical analysis implementation (median calculations, percentile filtering)
- Performance metrics interpretation and visualization design
- Business logic translation into technical requirements
- Dashboard user experience optimization

6. FEEDBACK AND EVIDENCE

The developed dashboard successfully implemented all required functionality with robust error handling. Formula syntax issues were systematically resolved through iterative testing and debugging. The time-based filtering system operates correctly, showing appropriate visualizations during specified hours. Data accuracy was verified through step-by-step validation of each conditional logic component. The dashboard demonstrates professional-level Power BI development with clean, maintainable code structure and efficient performance optimization.

7. CHALLENGES AND SOLUTIONS

Primary Challenge: MOD function syntax incompatibility required alternative mathematical approaches using division and integer operations. **Solution:** Implemented $\text{number}/2 = \text{INT}(\text{number}/2)$ for even number detection and $\text{number}/2 <> \text{INT}(\text{number}/2)$ for odd number identification.

Secondary Challenge: Complex nested AND functions exceeded system limitations requiring restructured conditional logic. **Solution:** Reorganized formulas using hierarchical AND nesting with maximum 2 arguments per function, maintaining logical accuracy while ensuring system compatibility.

Time Filter Challenge: Dynamic time-based visibility controls needed precise IST implementation. **Solution:** Developed robust time comparison logic using HOUR(NOW()) functions with appropriate timezone considerations.

8. OUTCOMES AND IMPACT

The completed dashboard provides comprehensive Twitter analytics with sophisticated filtering capabilities, enabling data-driven decision making for social media strategy optimization. The implementation demonstrates advanced Power BI proficiency and establishes a scalable framework for similar analytics projects. The time-based visibility feature adds practical business value by showing relevant information during operational hours. The project successfully bridges theoretical knowledge with practical business intelligence application, resulting in a professional-grade analytics solution.

9. CONCLUSION

This internship successfully achieved all technical objectives while developing significant expertise in advanced Power BI development. The project demonstrated capability in complex data analytics, formula optimization, and user experience design. The resulting dashboard serves as a comprehensive example of professional business intelligence development, showcasing advanced technical skills and analytical thinking. The experience has established a strong foundation for continued growth in data analytics and business intelligence fields, with practical applications immediately transferable to professional environments.