Call Center Data Analysis Report

Oluwafisayomi Akintayo

July 2025

Executive Summary

This report provides a comprehensive analysis of a telecom call center's performance using data from The Forage Virtual Experience Program. The primary aim is to derive actionable insights that can improve customer satisfaction, agent efficiency, and operational effectiveness. Over a 3-month period (January–March), 5,000 calls were analyzed across multiple dashboards using Power BI. Key findings include high resolution rates (89.94%), suboptimal customer satisfaction (3.40/5), and a concerning call abandonment rate (18.92%)—significantly higher than the industry benchmark.

Strategic recommendations such as enhanced agent training, smarter staffing during peak hours, and integration of AI support systems are proposed to optimize performance. This project demonstrates strong skills in data analysis, dashboard design, and business-oriented insight generation—valuable assets for any data-driven organization.

Table of Contents

Contents

1. Introduction

The telecom industry depends on efficient call center operations to support customers, resolve inquiries, and ensure satisfaction. A well-optimized call center enhances brand loyalty and directly impacts business performance. This report analyzes operational data and agent performance across five Power BI dashboards to assess trends, identify inefficiencies, and provide solutions for improving service delivery.

2. Objective

The objective of this analysis is to:

- Visualize and monitor call center performance.
- Assess agent efficiency and workload.
- Understand customer satisfaction dynamics.
- Identify operational bottlenecks and traffic patterns.
- Recommend data-driven improvements to optimize call center operations.

3. Dataset Information

The dataset used in this analysis is derived from The Forage Virtual Experience Program and spans January–March. Key variables include:

- **Call ID**: Unique identifier for each call
- **Agent**: Customer service representative handling the call
- **Date/Time**: When the call was initiated
- **Topic**: Type of inquiry (e.g., Technical, Payment, Contract)
- **Answered/Resolved**: Status of each call
- **Speed of Answer (sec)**
- **Talk Duration (sec)**
- **Satisfaction Rating** (1–5)

4. Data Preparation and Transformation

To ensure the integrity and usability of the data:

- **Missing Data**: Replaced nulls with zeroes to indicate unanswered calls.
- **Data Modeling**: Used a star schema with Fact and Dimension tables.
- **Cleaning**: Removed duplicates, ensured correct data types, and standardized formatting.
- **Feature Engineering**: Created derived columns such as Weekday Type, Call Hour, and Agent Groupings.
- **DAX Measures**: Developed custom KPIs for speed of answer, satisfaction trends, and agent resolution rates.

5. Tools & Technologies Used

- **Power BI**: For creating interactive dashboards, visualizing KPIs (Call Volume, Resolution Rate, CSAT Score), and applying DAX for custom metrics.
- **Microsoft Excel**: Used for initial data cleaning, structuring, and validation.
- **Data Analysis Techniques**: Trend analysis, KPI benchmarking, agent performance evaluation, customer satisfaction analysis.
- **DAX (Data Analysis Expressions)**: For calculated columns and custom measures like Average Call Duration, Resolution Time, and Call Handling Efficiency.
- **Professional Reporting**: Structured insights and business recommendations tailored for stakeholder decision-making.

6. Dashboard Overview

Five interactive Power BI dashboards were developed to monitor call center trends and agent performance. The **Overview Dashboard** offers a snapshot of key metrics: call volume, resolution rate, customer satisfaction, and traffic trends.

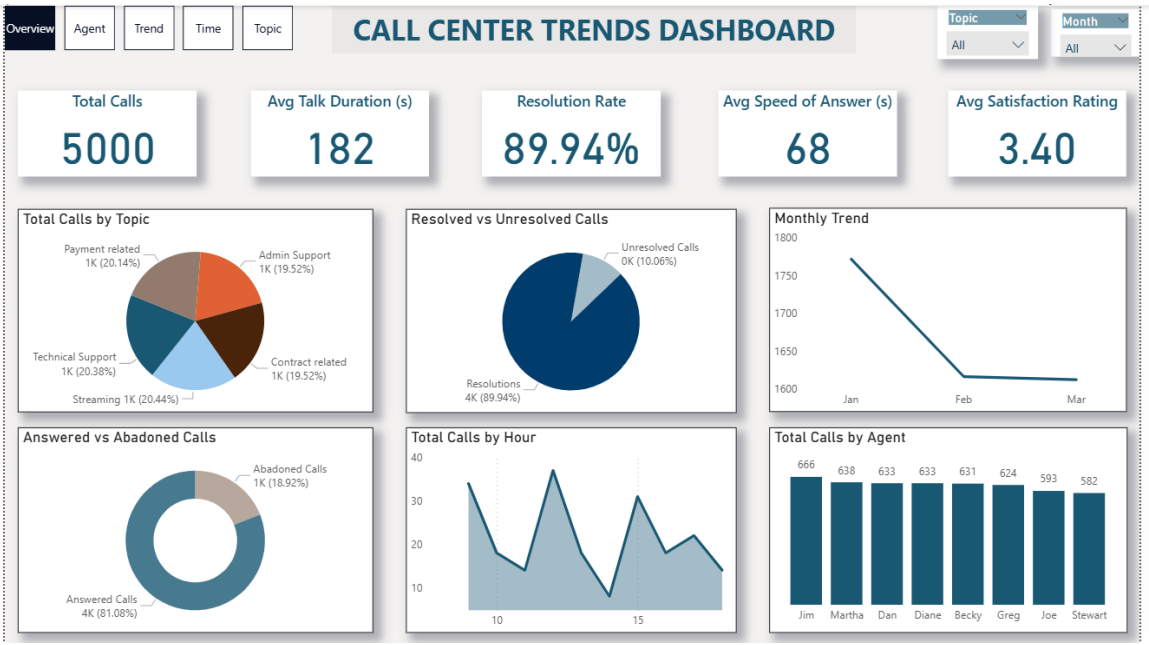

Figure 1: Overview Dashboard –Summarizing Call Center KPIs across Volume, Resolution, and Agent Metrics.

Highlights:

- 5,000 total calls; 89.94% resolved.
- Average call duration: 182 seconds.
- Average speed of answer: 68 seconds.
- Peak call time: 2 PM.
- Most frequent topics: Technical Issues, Streaming, and Payments.
- Agent Jim handled the most calls (666), showing high engagement.

Additional visualizations, including the Agent, Topic, and Time Dashboards, are presented in the 11. Appendix for deeper insights.

7. Analytical Insights

7.1 Call Center Performance Overview

Metric	Value
Total Calls	5,000

Answered Calls	81.08%
Abandoned Calls	18.92%
Resolution Rate	89.94%
Avg. Talk Duration	182 sec
Avg. Speed of Answer	68 sec
Customer Satisfaction	3.40 / 5

7.2 Call Handling Efficiency

- Weekdays had significantly higher call volumes than weekends (3,500 vs. 1,500).
- Mondays saw the highest call traffic (770 calls).
- Call abandonment peaked on **Wednesdays (19.88%)** and **Saturdays (20.05%)**.
- Abandonment rate (18.92%) exceeds industry norms (5–8%).

7.3 Agent Performance Evaluation

- **Top Agents by Resolution Rate:**
  Greg (90.64%), Dan (90.06%), Jim (90.49%)
- **Fastest Response:** Becky (65 sec average).
- **Highest Call Load:** Jim (666 calls).
- **Agent Needing Support:** Stewart (88.89% resolution rate).

7.4 Customer Satisfaction Trends

- **Highest Ratings (4.00):** 10 AM – aligned with strong resolution performance
- **Lowest Ratings (2.86–2.88):** 1–2 PM – aligned with lower resolution rates
- **Top-Rated Topics:** Admin Support (3.43), Technical Support (3.41)
- **Lowest-Rated Topic:** Contract Issues (3.38)

7.5 Call Volume and Traffic Patterns

- **Peak Hours:** 9 AM and 12 PM
- **Lowest Volume:** 2 PM

- **Worst Abandonment Rate:** 5 PM (36.36%)
- **Best Resolution Times:** 10 AM (92.86%), 12 PM (93.10%)

8. Recommendations

1. Improve Call Handling Efficiency

- Introduce a **call-back feature** to reduce abandonment.
- Align staffing schedules with **peak traffic periods**.
- Deploy **intelligent call routing** to direct calls to available/experienced agents.

2. Enhance Agent Performance

- Offer **targeted coaching** to low-performing agents.
- Incentivize agents with **performance-based rewards**.
- Ensure **equitable distribution** of call volume.

3. Boost Customer Satisfaction

- Reinforce training on **customer empathy and engagement**.
- Conduct **post-call surveys** for real-time feedback.
- Staff high-traffic hours with **high-performing agents**.

4. Optimize Operations with Technology

- Introduce **AI chatbots** to handle FAQs and simple queries.
- Analyze **unresolved call patterns** and update call-handling protocols.
- Regularly **review and update call scripts** based on issue trends.

5. Manage Peak Call Times Strategically

- Use **predictive analytics** to forecast call surges.
- Scale up availability during **mid-morning and noon hours**.
- Implement a **tiered support structure** to prioritize urgent or complex issues.

9. Limitations

While the analysis provides valuable insights, several limitations should be considered:

- **Data Scope**: The dataset covers only a 3-month period, which may not fully capture long-term trends or seasonality.
- **Customer Feedback Quality**: Satisfaction ratings are subjective and may not reflect the true sentiment of all customers, especially if feedback collection was optional.
- **Lack of Demographic Information**: The absence of customer demographics (e.g., age, location) limits the ability to segment insights by customer type.
- **Agent Context**: The analysis assumes uniform workload and availability among agents; factors like shift differences or part-time status were not accounted for.
- **Topic Classification**: Some call topics may overlap, and the classification process might have limitations in granularity or consistency.

Despite these constraints, the analysis still reveals critical patterns and offers practical, data-driven recommendations for improvement.

10. Conclusion

This call center analysis demonstrates strong performance in resolution rates and agent responsiveness, but highlights urgent areas for improvement such as high call abandonment and moderate customer satisfaction. By acting on the provided recommendations—through staff training, technology adoption, and smarter scheduling—the call center can significantly elevate its service quality and operational efficiency.

11. Appendix

This section contains additional dashboards developed during the analysis but not included in the main body of the report. These visualizations provide further insights into specific operational dimensions such as agent performance, contact trends, time-based call patterns, and topic-level analysis.

Appendix A: Agent Dashboard

This dashboard highlights the performance of individual call center agents across key performance indicators (KPIs) such as resolution rate, average talk time, customer satisfaction, and call handling volume. It is useful for identifying high-performing agents

and areas where additional training or support may be needed.

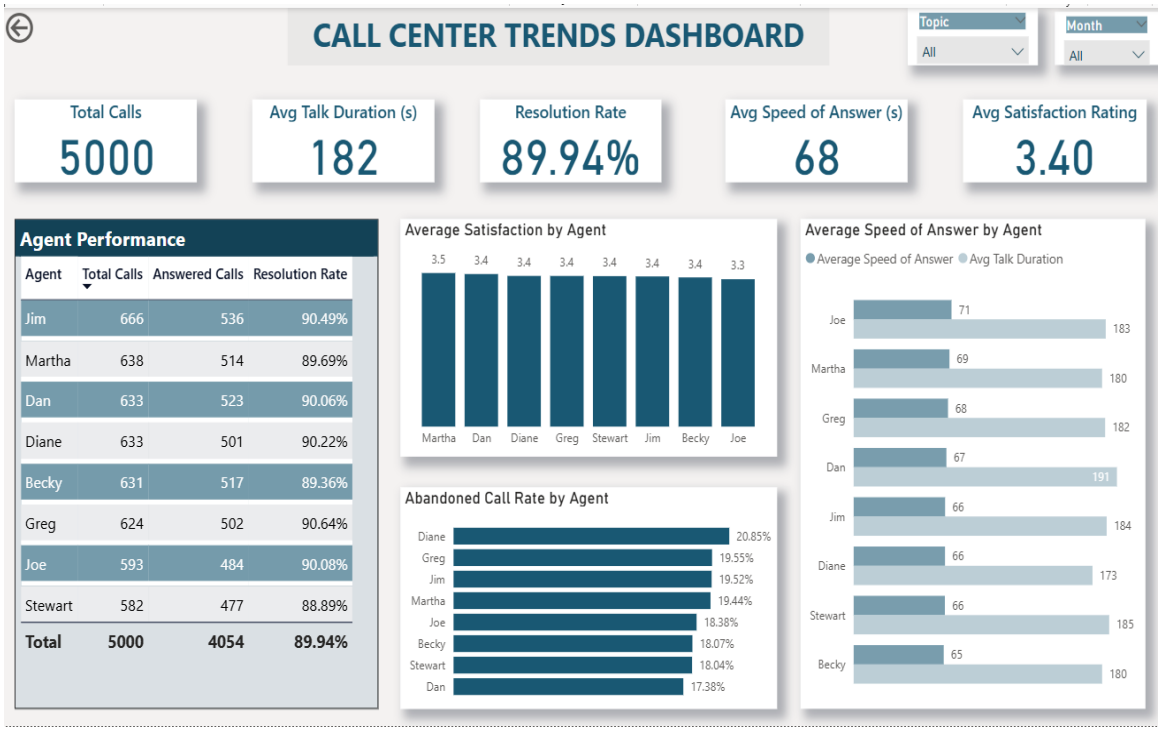

Figure 2: Agent Performance Metrics Dashboard
Visualizing resolution rate, satisfaction score, talk time, and call volume per agent.

Appendix B: Trend Dashboard

The Trend Dashboard provides a visual overview of call center performance trends over time. Metrics such as total calls received, resolved, abandoned, and customer satisfaction are tracked to detect patterns, peaks, or anomalies over daily or weekly periods.

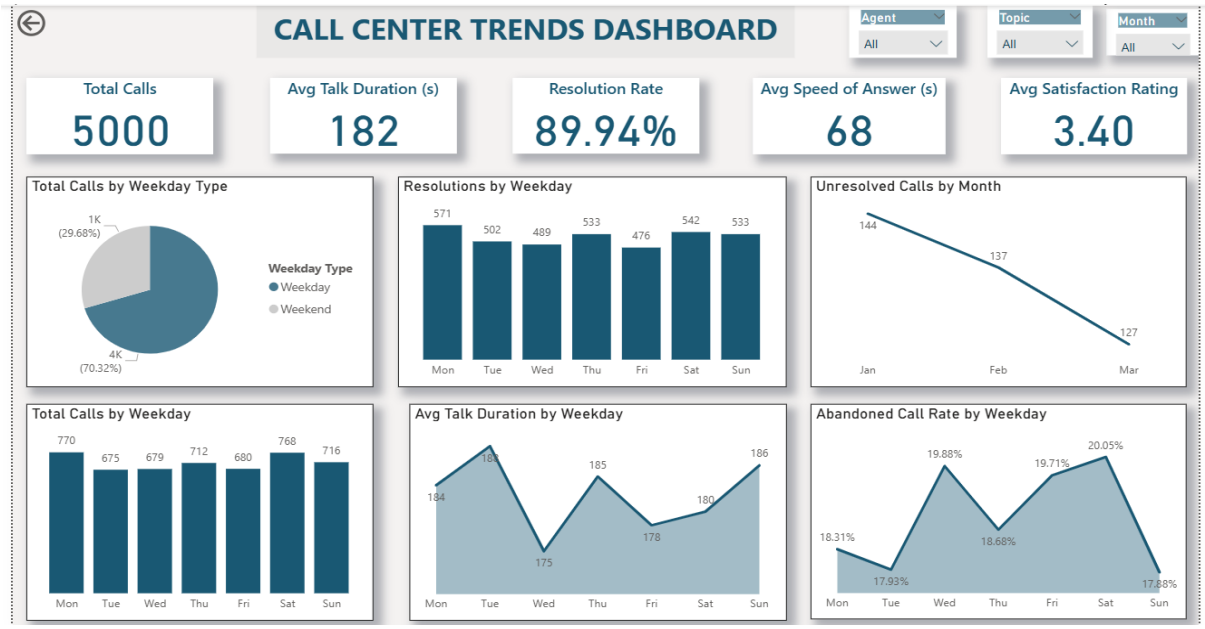

Figure 3: Call Center Performance Trend Dashboard
Displays changes in key metrics over time, enabling time-series performance monitoring.

Appendix C: Time Dashboard

This dashboard presents temporal distribution of calls, such as hourly and daily call volumes. It is particularly useful for workforce planning, shift allocation, and identifying peak call periods during the week or day.

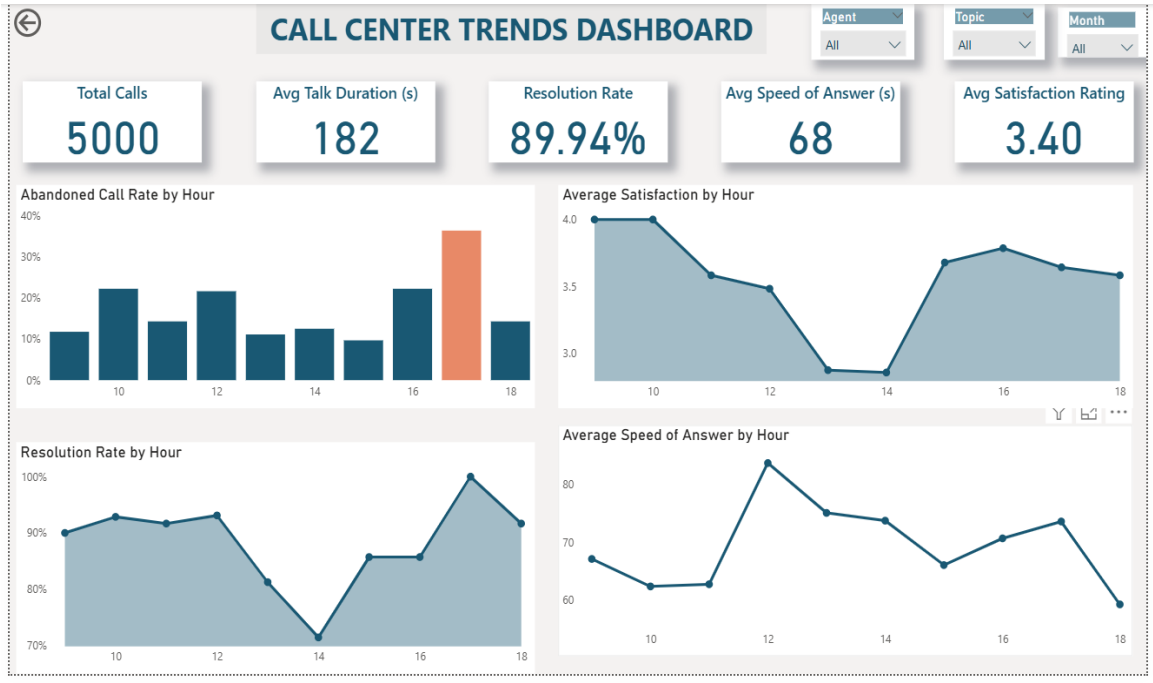

Figure 4: Time-Based Call Volume Dashboard
Analyzes call traffic by time of day and day of the week to support staffing decisions.

Appendix D: Topic Dashboard

The Topic Dashboard classifies and visualizes the common themes or reasons for customer contact. By understanding the distribution of call topics, call center leadership can align knowledge base content, automate frequent inquiries, and address systemic issues driving contacts.

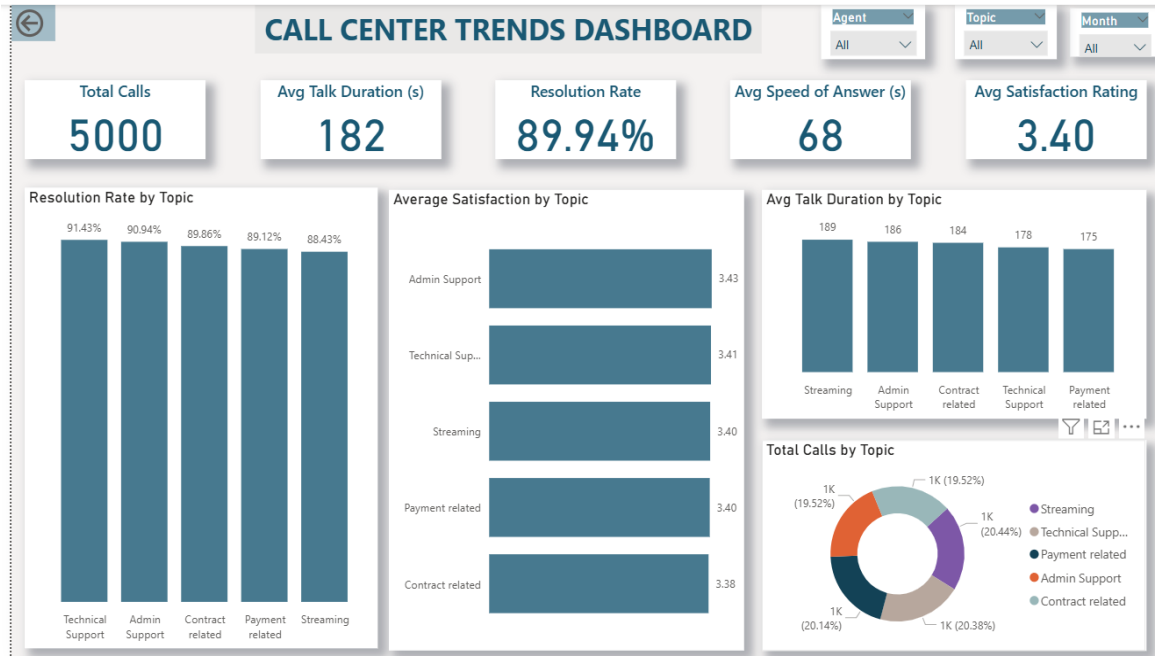

Figure 5: Call Topics Distribution Dashboard
Breakdown of customer call reasons by category, highlighting the most frequent topics.