POWER BI REPORT

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Title: Interactive Dashboard for Customer Care Performance Analysis

Domain: Telecom Industry

Tool Used: Microsoft Power BI

◆ 1. Executive Summary

The telecom industry relies heavily on customer engagement tools like chatbots and virtual assistants., I developed a **dynamic Power BI dashboard** to assess the **performance of a telecom customer care system**. This dashboard helps stakeholders evaluate **bot efficiency**, **customer interaction trends**, and **system resource consumption**, supporting **data-backed operational decisions**.

◆ 2. Business Problem Statement

Telecom support teams often face challenges such as:

- High query volume with inconsistent response quality
- Bot performance bottlenecks (latency, token limits)
- Regional or language-based performance variance
- Lack of real-time visibility into failures

The client required an **end-to-end solution** to monitor and analyze their bot-driven customer care system in both **English and Arabic**, supporting **peak query management, error tracking, and resource optimization**.

◆ 3. Objectives

- Build a centralized dashboard for **real-time monitoring** of support queries
- Analyze **success and failure rates** per query category
- Track **OpenAI resource consumption** (tokens, API calls)
- Enable insights into **geographical and language-wise engagement**
- Identify performance bottlenecks and improvement areas

◆ 4. Data Sources

- **Chatbot logs** (JSON, Excel)
- **OpenAI token usage reports**
- **User metadata** (Location, Language, Date)
- **Query and response datasets** with response status

All data was pre-processed and imported into Power BI for modeling.

◆ 5. Data Modeling Highlights

- Relationships between conversation_id, query_category, response_status, tokens_generated
- DAX measures created:
  - **Total Queries = COUNT(conversation_id)**
  - **Success Rate = DIVIDE(Success Count, Total Queries)**
  - **Peak Queries (Max) = MAX(Query Count)**
  - **Avg Tokens = AVERAGE(Tokens Generated)**
- Row-Level Security (RLS) enabled for language-based access control

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◆ 6. Dashboard Pages Overview

📌 a. Overview Page

- KPI Cards: Total Users, Total Queries, Success Rate, Peak Query Day
- Line Chart: Total Queries by Date
- Filter Pane: Multi-selectable slicer (Date, Category)

📌 b. Query Analysis Page

- Bar Chart: Queries by Category
- Pie Chart: Proportion by Custom_query_category
- Stacked Bar: Success vs. Failure per category

📌 c. Resource Consumption Page

- KPIs: Avg Tokens Used, Avg Tokens Generated, Avg API Calls
- Chart: Tokens Generated by Category
- Table: GPT vs ADA usage (if applicable)

📌 d. User Location & Language Insights

- Map: Gulf countries with user density
- Filter: Language, Category

- Card: Peak queries by date

📌 e. Failure Reasons

- Bar: Response status breakdown
- Bar: Count of conversation_id by failure reason
- Table: Raw queries with failure cause (e.g., “OpenAI Not Responding”)

📌 f. Bot Performance Analysis

- Bar: Average response time by custom_query_category
- Funnel: Count by response time category (Fast, Moderate, Slow)
- Clusteres Column Chart: Success Rate % with Total Queries by Category
- Table: Aggregated stats by query type

📌 g. Summary Page

- Visual Story: Chatbot image + textual insight
- Summary of key findings and goals
- Designed to aid storytelling in stakeholder presentations

◆ 7. Key Insights

- 📈 **General Inquiry** accounts for over **73%** of queries
- 🔧 Most **failures (29 total)** stemmed from "OpenAI Not Responding"
- 📍 Majority of users came from **UAE, Qatar, Bahrain**, with English and Arabic split
- 🔁 **Moderate response times** dominate (~71% of queries)
- 📊 Postpaid Plans and Visitor Line showed **100% success rate**, while General Inquiry had ~88%

◆ 8. Visual Design Choices

- **Color-coded cards**: Red = Alerts, Blue = Token Metrics, Purple = System Usage
- **Tooltips** and **data labels** for clarity
- **Slicers** for interactivity: Date, Language, Category
- **Map visual**: Geo-distribution made easy with Bing Maps
- **Font & layout**: Consistent modern aesthetic with high contrast for accessibility

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◆ 9. Challenges Faced

Challenge	Solution
Handling multilingual data -	Used filters for Arabic/English views
Token mismatch/missing values -	Data cleaning in Power Query
Visual clutter	Separated KPIs and trends by pages
Failure message inconsistency-	Grouped into “Other Failure” categories

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◆ 10. Impact & Benefits

- 📊 **Operational Efficiency**: Real-time view of performance
- 💬 **User Understanding**: Track popular queries & issues
- 🔄 **Process Optimization**: Identify weak spots in the system
- ⚙ **Scalable**: Can be reused for other language support or bots
- 📍 **Location-specific planning**: Useful for targeted campaigns or support hours

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❖ Key Measures Used-

Measure Name	Description
1. **Success Rate %-**	Percentage of successful responses to total queries.
2. **Total Queries-**	Total number of customer queries in the dataset.
3. **Average Tokens Used-**	Average number of tokens consumed by OpenAI per query.
4. **Average Tokens Generated-**	Average number of tokens produced in OpenAI’s response.
5. **Average Response Time-**	Mean time taken to respond to a user query.
6. **Failure Reason Count-**	Number of times each failure reason appeared.
7. **Peak Queries (in a Day)-**	Maximum number of queries on the highest activity day.
8. **Total Users-**	Count of distinct users interacting with the bot.

◆ 11. Skills Gained

- Power BI:
  - DAX Measures
  - Drill-Through & Tooltips
  - RLS Implementation
  - Scheduled Refresh Setup
- Data Analytics:
  - KPIs definition

    - Query trend analysis
    - Visual storytelling
- Business Understanding:
    - Telecom support system
    - AI-driven query handling
    - Failure analysis and diagnostics

◆ 12. Future Scope

- Add **real-time alerts** for failure spikes
- Introduce **Sentiment Analysis** for user queries
- Automate reports with **Power Automate integration**
- Add **benchmarking** vs. SLA goals (e.g., <10s avg response time)

Advantages of the Power BI Customer Care Dashboard

1. **Real-Time Monitoring**
    - Track customer queries and bot performance instantly using scheduled refresh.
2. **Multilingual Support**
    - Enables performance tracking for both **Arabic and English** users, improving regional inclusivity.
3. **Enhanced Decision-Making**
    - Provides actionable insights using KPIs like success rate, token usage, and query trends.
4. **Custom Visuals & Interactivity**
    - Drill-downs, tooltips, and slicers make data exploration easy for non-technical users.
5. **Data Security with RLS**
    - Row-Level Security ensures users see only relevant data, which is important in telecom/data-sensitive environments.
6. **Resource Optimization**
    - Helps identify which query categories consume the most tokens or have low response rates.
7. **Visual Clarity**
    - Charts, cards, and maps help communicate complex insights at a glance.
8. **Scalability**
    - Easily extendable to more query categories, regions, or languages.

Disadvantages / Limitations

1. **Data Latency (if refresh fails)**
    - Scheduled refresh depends on the data gateway and may fail if not configured correctly.
2. **Token-Level Detail Limitations**

    - Limited granularity if raw API logs are missing or aggregated too early.
3. **Language-based Response Analysis Could Be Improved**
    - No sentiment analysis or NLP to differentiate intent/emotion.
4. **OpenAI Dependency**
    - Failures caused by "OpenAI Not Responding" may need third-party monitoring tools.
5. **No Real-Time Alerting**
    - Dashboard doesn't currently send alerts for failure spikes or anomalies.

📌 Use Cases

Use Case	Description
Bot Optimization -	Identify categories with poor success rates for bot retraining.
Support Load Balancing-	Determine peak days and allocate human support if needed.
Language-Based Insights-	Analyze whether Arabic or English users face more issues.
Query Category Prioritization-	Focus on the most common queries (e.g., General Inquiry).
Regional Expansion-	Use location data to plan localized support in high-density areas.
Performance Benchmarking-	Compare success rates and response times across categories.

🌐 Practical Applications

- **Telecom Customer Care Teams**: Monitor chatbot usage and improve user satisfaction.
- **AI Model Trainers**: Identify query types or phrases that frequently cause failure.
- **Product Teams**: Spot product-related inquiries to improve documentation.
- **CX Leadership**: Evaluate customer experience through performance KPIs.
- **IT/Data Teams**: Use token trends for OpenAI budget planning and forecasting.

💡 SWOT Analysis (Quick Overview)

Category	Points
Strengths-	Rich interactivity, clear KPIs, multi-language support, RLS for security
Weaknesses-	Limited real-time alerting, no NLP/emotion detection
Opportunities-	Integrate with Azure Cognitive Services, real-time bot feedback
Threats-	API downtime from OpenAI, data refresh issues, privacy compliance risks

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✅ Conclusion: Value Delivered

This Power BI dashboard project added measurable value by:

- Unifying multi-language user insights
- Enabling actionable performance tracking
- Supporting informed decision-making through data

By leveraging Microsoft Power BI's full stack of features—modeling, visualization, and interactivity—it has laid the foundation for scalable, insight-driven customer support operations.

◆ 13. Appendix

- Screenshot thumbnails of each report page