Innovation & Entrepreneurship Hub for Educated Rural Youth (SURE Trust – IERY)

CONSUMER COMPLAINTS

The domain of the Project:

SQL & POWERBI(MAJOR PROJECT)

Under the guidance of

Ms. Siddhika Shah (Software Engineer at HCLTech)

By:

Ms. Gopika N G (BTech CSE Graduate)

Period of the project

May 2025 to August 2025

Declaration

The project titled “Customer Complaints” has been mentored by Ms.Siddhika Shah, organised by SURE Trust, from May 2025 to August 2025, for the benefit of the educated unemployed rural youth for gaining hands-on experience in working on industry relevant projects that would take them closer to the prospective employer. This initiative aims to benefit educated unemployed rural youth by providing hands-on experience in industry-relevant projects, thereby enhancing employability.

I, Ms. Gopika N G, hereby declare that I have solely worked on this project under the guidance of my mentor. This project has significantly enhanced my practical knowledge and skills in the domain.

Siddhika Shah
Software Engineer—HCLTech

Prof. Radhakumari
Executive Director & Founder
SURE Trust

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Executive Summary

Objectives:

- Develop an interactive Power BI dashboard for analyzing customer complaints.
- Track and visualize key KPIs such as total complaints, average resolution delay, and timely response rate.
- Provide insights into complaint sources, product categories, state-wise trends, and company responses.
- Enable stakeholders to drill down from high-level overview to specific issues and sub-products.

Methods:

- Used Power BI Desktop for dashboard design and visualization.
- Applied Power Query for data cleaning and transformation.
- Designed a star schema data model with fact and dimension tables (Product, Issue, Date).
- Implemented DAX measures to calculate KPIs like No. of Complaints, Avg Delay, and Timely Response Rate.
- Created four dashboards (Overview, Product & Issue Drill Down, Company Response Analysis, Time & Performance) and a Home Page.

Key Findings:

- Web submissions are the dominant complaint channel.
- Checking/Savings Accounts and Credit Cards have the highest complaint volume.
- California records the maximum state-level complaints.
- Most complaints are closed with explanation (65%), but only 50% are resolved on time.
- Complaints show monthly fluctuations with visible seasonal peaks.
- Resolution delays vary, indicating inconsistent complaint handling efficiency.

Recommendations:

- Improve timely response rates to increase customer trust.
- Allocate resources to high-complaint products and regions (e.g., Checking Accounts, California).
- Enhance digital complaint-handling systems since web is the primary channel.
- Use insights to train customer service teams and strengthen resolution mechanisms.

- Extend the dashboard for real-time monitoring and predictive analysis.

Highlights for Executives/Stakeholders:

- Provides a one-stop solution for tracking and analyzing customer complaints.
- Delivers data-driven insights for improving service quality and compliance.
- Helps organizations prioritize issues, allocate resources efficiently, and enhance customer satisfaction.
- Acts as a strategic tool for decision-makers to monitor complaint trends and improve industry reputation.

Introduction

Background and Context:

- Customer complaints are a key measure of service quality and customer satisfaction.
- Organizations often struggle to analyze large volumes of complaints manually.
- Business Intelligence tools like Power BI enable transformation of raw complaint data into actionable insights.
- The project focuses on building a customer complaints dashboard to assist businesses in tracking and resolving issues effectively.

Problem Statement / Goals:

- Lack of a centralized system for analyzing complaint data leads to inefficiencies.
- Companies face challenges in identifying high-complaint products, regions, and channels.
- Goals of the project:
    - Build a Power BI dashboard to track complaint KPIs.
    - Provide insights into complaint sources, product categories, and company responses.
    - Help stakeholders monitor timely resolutions and resolution delays.

Scope and Limitations:

- **Scope:**
    - Covers data visualization across four dashboards (Overview, Product & Issue Drill Down, Company Response Analysis, Time & Performance).
    - Enables drill-down analysis by product, issue, state, and time period.
    - Provides KPIs and filters for interactive analysis.
- **Limitations:**
    - Based on a historical dataset (not real-time).
    - Limited to the fields available in the dataset (does not include customer demographics, detailed feedback text, etc.).
    - Predictive analytics and sentiment analysis are not included in the current version.

Innovation Component:

- Introduced a Home Page dashboard for quick navigation and executive-level insights.
- Designed a star schema data model for structured analysis.

- Applied DAX measures for advanced KPIs like average delay and timely response rate.
- Incorporated interactive drill-through from product-level to issue-level details.
- Combined multiple visuals (maps, treemaps, heatmaps, KPI cards) to provide a 360° view of complaint data.

Project Objectives

Objectives and Goals:

- Develop an interactive Power BI dashboard for analyzing customer complaints.
- Track and present key KPIs such as total complaints, average delay, and timely response rate.
- Identify top complaint channels (Web, Phone, Email, etc.) and their contribution.
- Analyze product-wise, sub-product-wise, and issue-wise complaints through drill-down visualizations.
- Evaluate company responses and measure the proportion of timely vs untimely resolutions.
- Study time-based complaint trends (monthly, quarterly, yearly) and resolution delays.
- Map state-wise and region-wise complaint distribution to highlight high-risk areas.
- Provide filtering and drill-through options for interactive data exploration.
- Support decision-making for businesses, regulators, and stakeholders by identifying areas of improvement.

Expected Outcomes and Deliverables:

- A fully functional Power BI dashboard with four main pages:
    1. Overview Dashboard (KPI summary, channel distribution, complaints by product and state).
    2. Product & Issue Drill-Down Dashboard (hierarchical breakdown).
    3. Company Response Analysis Dashboard (resolution status and timeliness).
    4. Time & Performance Dashboard (trends, delays, and geographical view).
- A Home Page dashboard for executive-level navigation and summary.
- DAX measures for calculating business KPIs (No. of Complaints, Avg Delay, Timely Response %).
- Insights to improve customer service efficiency and increase complaint resolution rates.
- Documentation of findings, recommendations, and future scope for stakeholders**.**

Methodology and Results

Methods / Technology Used:

- Adopted Business Intelligence methodology for data-driven analysis.
- Designed dashboards using data modeling, DAX measures, and visualization best practices.
- Implemented star schema architecture to connect fact and dimension tables.
- Applied ETL process (Extract, Transform, Load) using Power Query.

Tools / Software Used:

- Microsoft Power BI Desktop → Dashboard development and visualization.
- Power Query → Data cleaning, transformation, and integration.
- Excel/CSV Dataset → Input data source for complaints.
- DAX (Data Analysis Expressions) → Calculations for KPIs and measures.

Data Collection Approach:

- Dataset includes customer complaints with details such as:
    - Complaint ID, Product, Sub-Product, Issue, Sub-Issue.
    - Submission Method (Web, Phone, Email, etc.).
    - State/Region of complaint.
    - Company Response type and Timely Response flag.
    - Date Submitted and Date Received.
- Data was imported into Power BI and structured for analysis.

Project Architecture:

1. Data Source: Complaint dataset (Excel/CSV).
2. Data Transformation: Cleaning & normalization using Power Query.
3. Data Modeling:
    - Fact Table → Complaints (Complaint ID, Dates, Response, Channel).
    - Dimension Tables → Product, Issue, Date.
4. Measures & KPIs: DAX used to calculate No. of Complaints, Avg Delay, Timely Response %.
5. Dashboard Design:

- Overview Page → KPIs, complaint channels, products, states, trends.
- Product & Issue Drill-Down → Treemap, stacked bar, matrix.
- Company Response Analysis → Donut chart, bar chart, word cloud.
- Time & Performance → Line chart, combo chart, heatmap, map view.
- Home Page → KPIs + quick navigation filters.

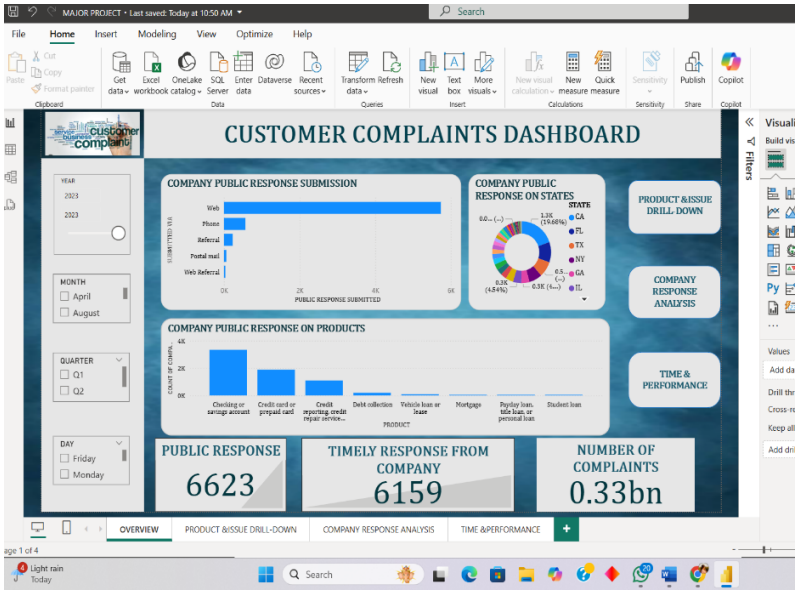
6. Output: Interactive dashboards for monitoring and decision-making.

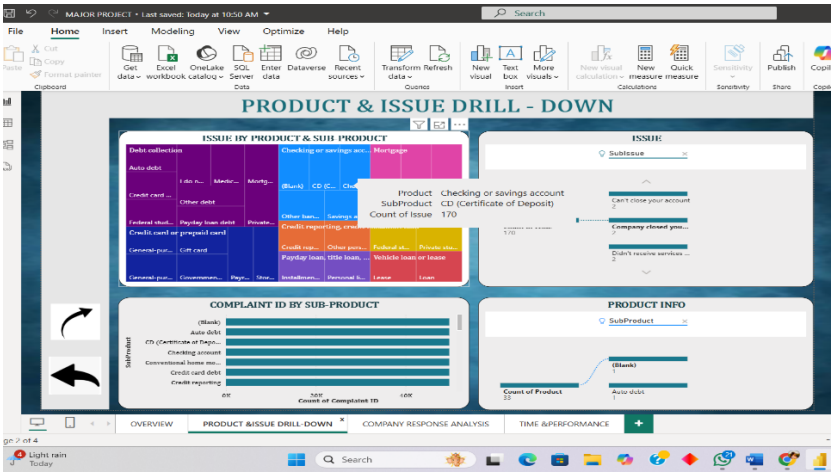
Final Project Working Screenshots & Explanation:

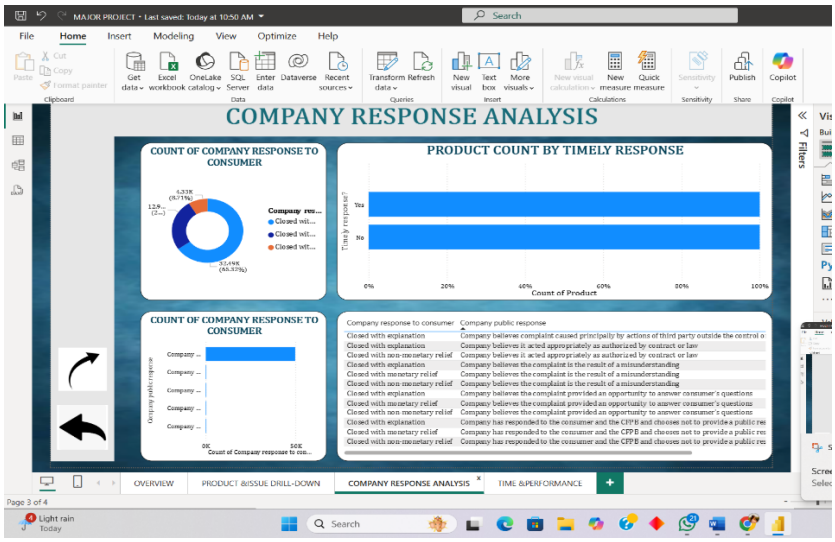
- Overview Page: Displays KPIs, complaints by product/state, channel distribution, and trends.
- Product Drill-Down: Visual hierarchy of product → sub-product → issue with drill-through analysis.
- Company Response Page: Breakdown of complaint resolution types and timely vs untimely responses.
- Time & Performance Page: Monthly trends, avg delay vs complaint volume, and geo-distribution on map.
- Home Page: Serves as the landing page with KPIs, filters, and navigation links to other dashboards.

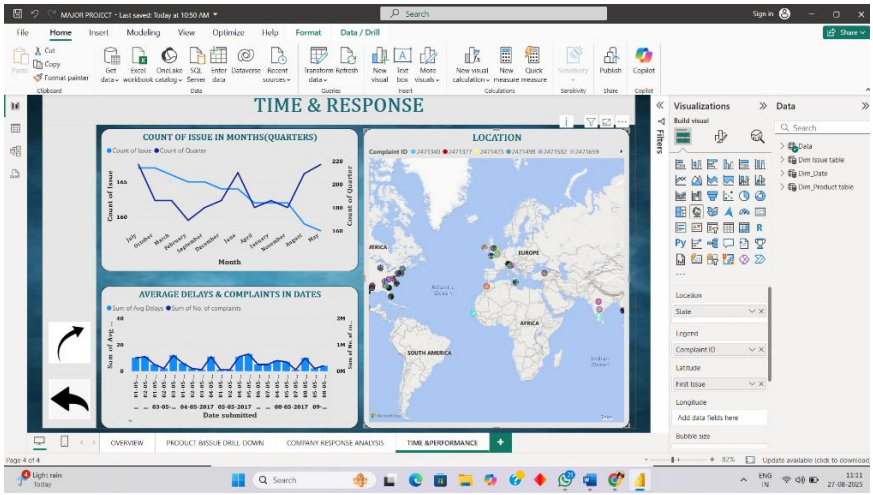
Project GitHub Link:

https://github.com/Gopika-N-G/SQL-POWERBI-PROJECT




PRODUCT & ISSUE DRILL - DOWN
ISSUE BY PRODUCT & SUB PRODUCT
ISSUE
COMPLAINT ID BY SUB-PRODUCT
PRODUCT INFO
OVERVIEW
PRODUCT &ISSUE DRILL-DOWN
COMPANY RESPONSE ANALYSIS
TIME &PERFORMANCE


COMPANY RESPONSE ANALYSIS
COUNT OF COMPANY RESPONSE TO CONSUMER
PRODUCT COUNT BY TIMELY RESPONSE
COUNT OF COMPANY RESPONSE TO CONSUMER
OVERVIEW
PRODUCT &ISSUE DRILL-DOWN
COMPANY RESPONSE ANALYSIS
TIME &PERFORMANCE


TIME & RESPONSE
COUNT OF ISSUE IN MONTHS(QUARTERS)
LOCATION
AVERAGE DELAYS & COMPLAINTS IN DATES
OVERVIEW
PRODUCT &ISSUE DRILL-DOWN
COMPANY RESPONSE ANALYSIS
TIME &PERFORMANCE

Learning and Reflection

New Learnings (Technology & Skills):

- Learned how to use Power BI for end-to-end dashboard development.
- Gained experience in data cleaning and transformation using Power Query.
- Developed skills in writing DAX measures to calculate KPIs such as total complaints, avg delay, and timely response %.
- Understood the concept of star schema data modelling for business intelligence projects.
- Learned to design interactive dashboards with visuals like KPI cards, treemaps, maps, heatmaps, and trend charts.
- Improved ability to interpret raw datasets into business insights for decision-making.

Personal Experience:

- Worked independently to handle the entire project cycle from data preparation → modeling → visualization → reporting.
- Understood the importance of data-driven analysis in improving service efficiency and customer satisfaction.
- Experienced how a BI tool like Power BI can simplify complex datasets into clear, actionable reports.
- Enhanced problem-solving and analytical thinking skills by identifying patterns and insights from complaint data.
- Overall, the project was a valuable practical experience that bridged academic knowledge with real-world industry practices.

Conclusion and Future Scope

Recap of Objectives and Achievements:

- Successfully developed an interactive Power BI dashboard for analysing customer complaints.
- Tracked and visualized key KPIs: total complaints, average resolution delay, and timely response rate.
- Provided insights into complaint sources, product categories, issues, and state-wise distribution.
- Analysed company responses and identified gaps in timely complaint handling.
- Built four dashboards + home page covering overview, product drill-down, company response, and time/performance.
- Achieved the goal of converting raw complaint data into actionable insights for decision-making.

Future Scope of the Project:

- Integration of real-time complaint data feeds for continuous monitoring.
- Implementation of predictive analytics to forecast future complaint volumes and resolution delays.
- Addition of sentiment analysis on text-based customer feedback for deeper insights.
- Development of mobile-friendly dashboards for quick access by executives.
- Expansion of framework to other industries such as telecom, healthcare, and retail.
- Incorporation of AI-driven recommendations to suggest proactive measures for reducing complaints.
- Linking with customer satisfaction survey data to create a combined view of service performance.

THANK YOU