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

SURE TRUST PROGRAM - COMPLETE PROJECT PORTFOLIO REPORT

The domain of the Project:

POWER BI & SQL

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 projects presented in this report have been mentored by Ms. Siddhika Shah, organized by SURE Trust, from May 2025 to August 2025, for the benefit of educated unemployed rural youth for gaining hands-on experience in working on industry-relevant projects that would take them closer to prospective employers. 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 these projects under the guidance of my mentor. These projects have significantly enhanced my practical knowledge and skills in the SQL & Power BI domain.

Siddhika Shah
Software Engineer—HCLTech

Prof. Radhakumari
Executive Director & Founder
SURE Trust

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EXECUTIVE SUMMARY

This report presents a comprehensive portfolio of three projects completed during the SURE Trust SQL & Power BI program, demonstrating progressive skill development from database integration to advanced business intelligence solutions.

Key Achievements Across All Projects:

- **Technical Mastery:** Successfully implemented end-to-end solutions using Python, MySQL, Power BI, and various APIs
- **Data Integration:** Developed automated data pipelines connecting cloud services with databases
- **Business Intelligence:** Created interactive dashboards providing actionable insights for decision-making
- **Industry Applications:** Addressed real-world challenges in automation, financial services, and customer service sectors

Combined Impact:

- Automated manual processes saving hours of work
- Provided data-driven insights for strategic decision-making
- Demonstrated scalable solutions applicable across multiple industries
- Showcased progression from technical implementation to business intelligence visualization

PROJECT PORTFOLIO OVERVIEW

Project	Type	Domain	Technologies	Key Focus
Google Forms to MySQL Integration	Mini Project	Automation & Data Integration	Python, MySQL, Google APIs	Backend Development & Automation
Bank Loan Application Analysis	Mini Project	Financial Analytics	Power BI, DAX, Data Modeling	Business Intelligence & Risk Analysis
Consumer Complaints Dashboard	Major Project	Customer Service Analytics	Power BI, Advanced Visualizations	Comprehensive BI Solution

PROJECT 1: GOOGLE FORMS TO MYSQL INTEGRATION

Project Overview

Objective: Develop an automated system that synchronizes Google Forms responses with MySQL database, providing real-time data processing and validation for meeting feedback collection.

Technical Implementation

Architecture Components:

1. **GoogleSheetsClient Class:** Authentication and data retrieval from Google Forms
2. **DatabaseManager Class:** MySQL operations with connection management
3. **MeetingFeedbackProcessor Class:** Complete synchronization workflow orchestration
4. **Configuration Management:** JSON-based environment-specific settings

Key Technologies:

- **Programming:** Python 3.8+ with object-oriented approach
- **APIs:** Google Sheets API, Google Drive API
- **Database:** MySQL (FreeSQLDatabase.com)
- **Libraries:** mysql-connector-python, gspread, google-oauth2, pandas, schedule
- **Development Environment:** Visual Studio Code

Data Flow:

Google Forms → Google Sheets → Python Application → MySQL Database

Key Features Implemented:

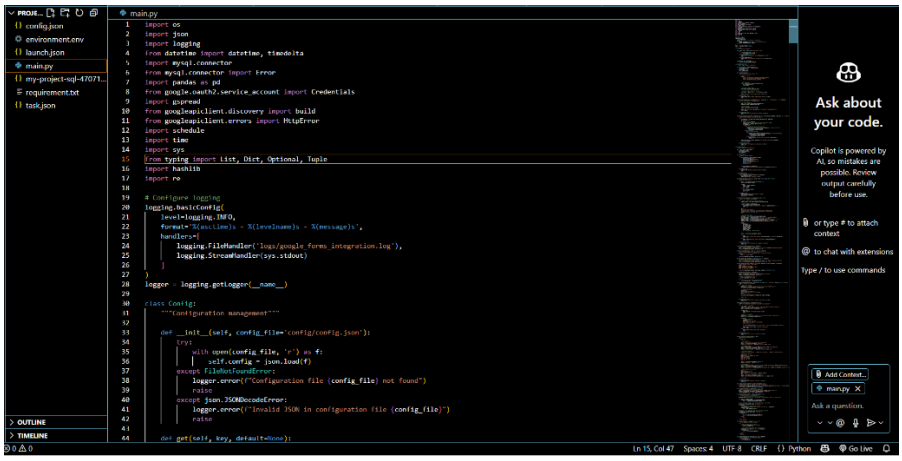
1. **Automated Data Synchronization**
    - Real-time data retrieval with timestamp-based filtering
    - Hash-based duplicate detection and prevention
    - Comprehensive error handling and recovery mechanisms
2. **Flexible Execution Modes**
    - Full Sync: Complete synchronization process
    - Sync Only: Data retrieval and insertion
    - Process: Mark responses as processed

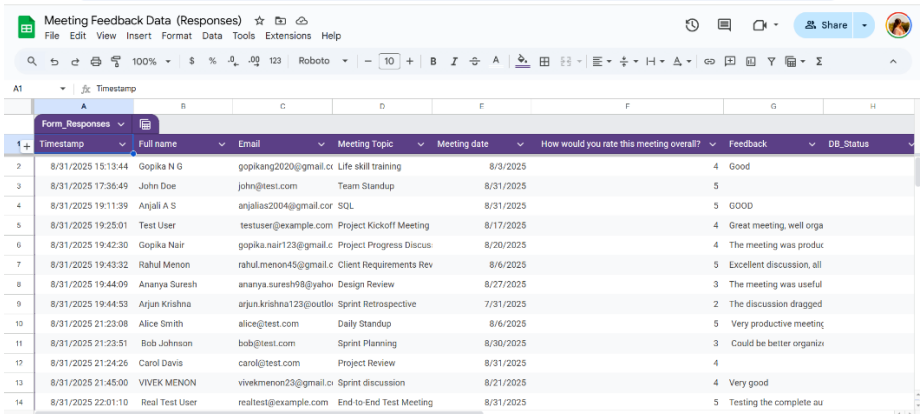
- Validate: Data validation and reporting
- Schedule: Automated recurring execution

3. **Monitoring & Reporting**
   - Comprehensive logging system
   - Statistical analysis and reporting
   - Processing statistics generation

Results Achieved:

- 100% data integrity with duplicate prevention
- Automated scheduling with multiple execution modes
- Comprehensive error handling and recovery
- Detailed processing statistics and reports





Timestamp	Full name	Email	Meeting Topic	Meeting date	How would you rate this meeting overall?	Feedback	DB_Status
8/31/2025 15:13:44	Gopika N G	gopikang2020@gmail.c	Life skill training	8/3/2025	4	Good	
8/31/2025 17:36:49	John Doe	john@test.com	Team Standup	8/31/2025	5		
8/31/2025 19:11:39	Anjali A S	anjalias2004@gmail.cor	SQL	8/31/2025	5	GOOD	
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8/31/2025 19:42:30	Gopika Nair	gopika.nair123@gmail.c	Project Progress Discus	8/20/2025	4	The meeting was produc	
8/31/2025 19:43:32	Rahul Menon	rahul.menon45@gmail.c	Client Requirements Rev	8/6/2025	5	Excellent discussion, all	
8/31/2025 19:44:09	Ananya Suresh	ananya.suresh98@yaho	Design Review	8/27/2025	3	The meeting was useful	
8/31/2025 19:44:53	Arjun Krishna	arjun.krishna123@outlo	Sprint Retrospective	7/31/2025	2	The discussion dragged	
8/31/2025 21:23:08	Alice Smith	alice@test.com	Daily Standup	8/6/2025	5	Very productive meeting	
8/31/2025 21:23:51	Bob Johnson	bob@test.com	Sprint Planning	8/30/2025	3	Could be better organize	
8/31/2025 21:24:26	Carol Davis	carol@test.com	Project Review	8/31/2025	4		
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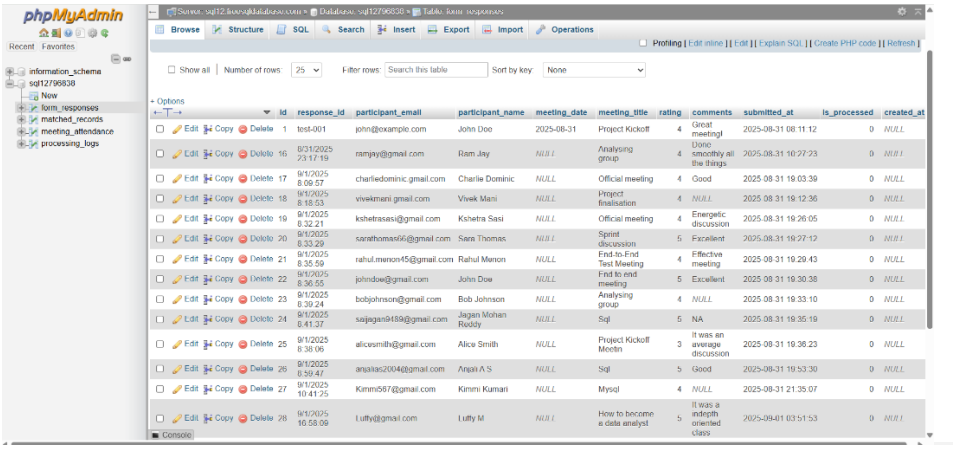
8/31/2025 22:01:10	Real Test User	realtest@example.com	End-to-End Test Meeting	8/31/2025	5	Testing the complete au	


phpMyAdmin
Recent Favorites
information_schema
sql12796836
New
form_responses
matched_records
meeting_attendance
processing_logs
Browse
Structure
SQL
Search
Insert
Export
Import
Operations
Profiling [Edit inline] [Edit] [Explain SQL] [Create PHP code] [Refresh]
Show all
Number of rows: 25
Filter rows: Search this table
Sort by key: None
+ Options
id response_id participant_email participant_name meeting_date meeting_title rating comments submitted_at is_processed created_at
1 test-001 john@example.com John Doe 2025-08-31 Project Kickoff 4 Great meeting! 2025-08-31 08:11:12 0 NULL
16 8/31/2025 23:17:19 ramjay@gmail.com Ram Jay NULL Analysing group 4 Done smoothly all the things 2025-08-31 18:27:23 0 NULL
17 9/1/2025 8:09:57 charliedominic.gmail.com Charlie Dominic NULL Official meeting 4 Good 2025-08-31 19:03:39 0 NULL
18 9/1/2025 8:18:53 vivekmani.gmail.com Vivek Mani NULL Project finalisation 4 NULL 2025-08-31 19:12:36 0 NULL
19 9/1/2025 8:32:21 kshetrasasi@gmail.com Kshetra Sasi NULL Official meeting 4 Energetic discussion 2025-08-31 19:26:05 0 NULL
20 9/1/2025 8:33:29 sarathomas66@gmail.com Sara Thomas NULL Sprint discussion 5 Excellent 2025-08-31 19:27:12 0 NULL
21 9/1/2025 8:35:59 rahul.menon45@gmail.com Rahul Menon NULL End-to-End Test Meeting 4 Effective meeting 2025-08-31 19:29:43 0 NULL
22 9/1/2025 8:36:55 johndoe@gmail.com John Doe NULL End to end meeting 5 Excellent 2025-08-31 19:30:38 0 NULL
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26 9/1/2025 8:59:47 angalas2004@gmail.com Angal A S NULL Sql 5 Good 2025-08-31 19:53:30 0 NULL
27 9/1/2025 10:41:25 Kimmi567@gmail.com Kimmi Kumari NULL Mysql 4 NULL 2025-08-31 21:35:07 0 NULL
28 9/1/2025 16:58:09 Lutfy@gmail.com Lutfy M NULL How to become a data analyst 5 It was a indepth oriented class 2025-09-01 03:51:53 0 NULL
Console

PROJECT 2: BANK LOAN APPLICATION ANALYSIS

Project Overview

Objective: Analyze bank loan applications and detect fraud risks using Power BI to provide insights for loan approval decisions and risk mitigation.

Business Intelligence Implementation

Data Analysis Focus:

- **Risk Assessment:** CIBIL score impact on loan approval and fraud detection
- **Applicant Profiling:** Age, income, dependents, employment status analysis
- **Fraud Detection:** Pattern analysis by employment status and gender
- **Loan Characteristics:** Purpose distribution by property ownership

Dashboard Architecture:

1. **Dashboard 1:** CIBIL score analysis, loan amount vs income correlation
2. **Dashboard 2:** Age-based loan type trends, fraud detection patterns
3. **Home Page:** Executive summary with key performance indicators

Key Findings:

Risk Analysis:

- CIBIL score serves as primary indicator for loan approval and fraud detection
- Younger applicants tend to request higher loan amounts
- Middle-aged applicants show more stable application patterns

Fraud Detection Insights:

- Fraud patterns vary significantly by employment status
- Gender-based fraud detection reveals distinct risk profiles
- Property ownership status influences loan purpose distribution

Loan Distribution:

- Even distribution across Owned, Rented, and Jointly Owned properties
- Loan purposes correlate with property ownership types

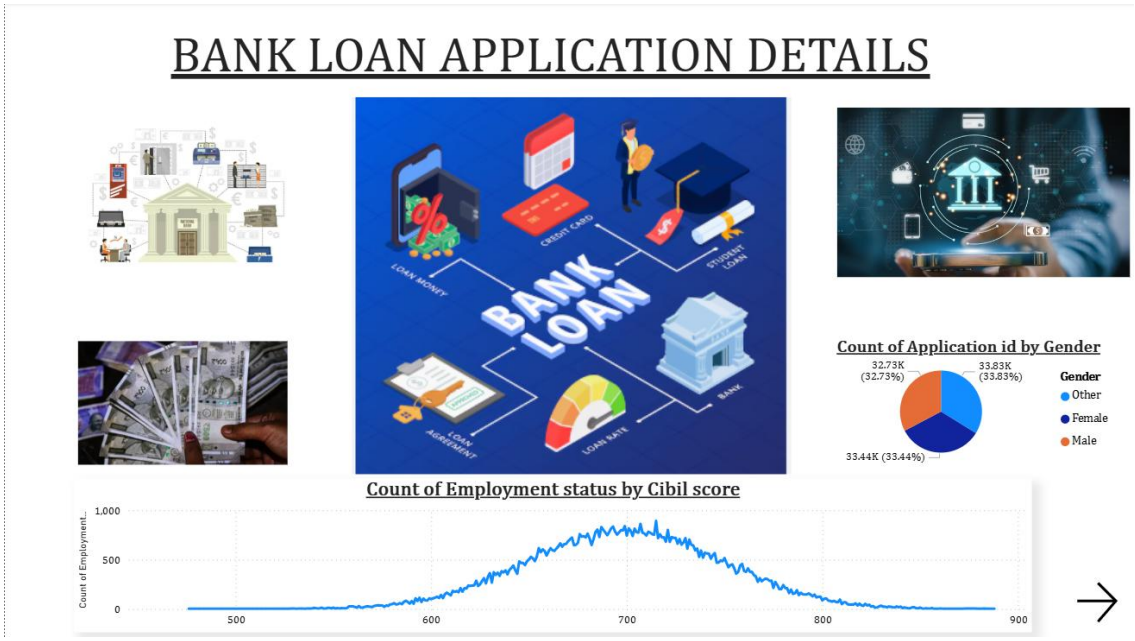
- Income levels strongly predict loan amount requests

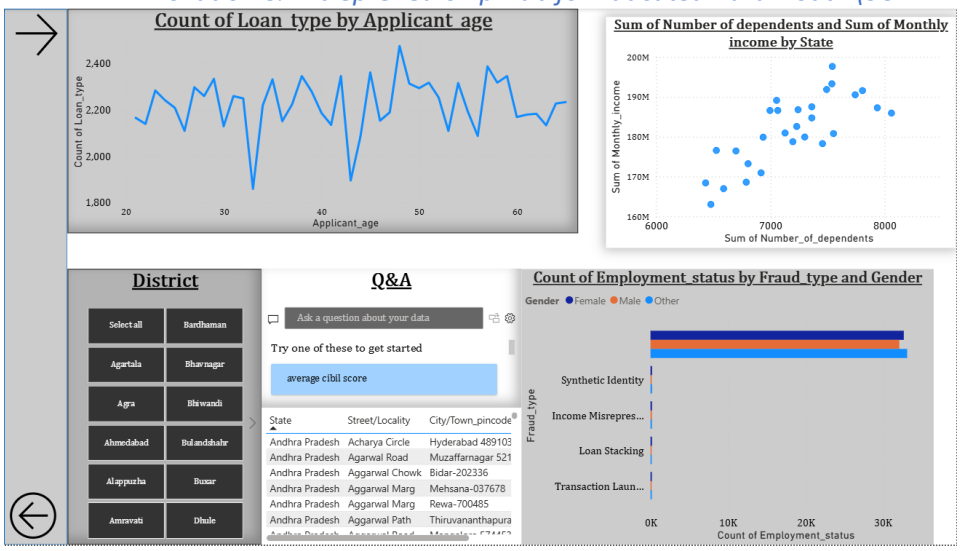
Technical Implementation:

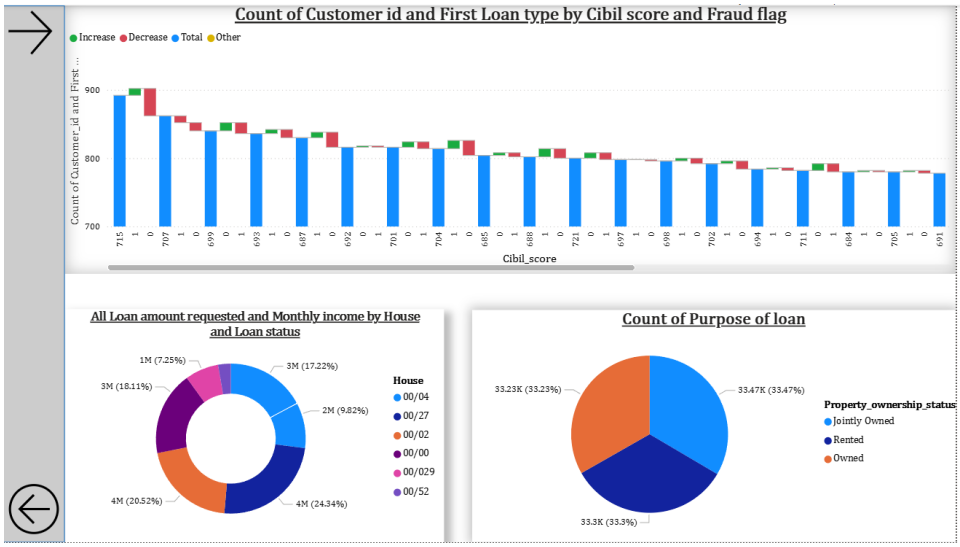
- **Power BI Desktop:** Dashboard development and visualization
- **Power Query:** Data cleaning and transformation
- **DAX Measures:** CIBIL score averages, fraud detection counts, approval analysis
- **Data Modeling:** Fact table structure with applicant attributes

Business Impact:

- Enhanced fraud detection capabilities
- Data-driven loan approval processes
- Risk-based resource allocation strategies
- Improved applicant assessment accuracy




Count of Loan_type by Applicant_age
Count of Loan_type
Applicant_age
Sum of Number_of_dependents and Sum of Monthly income by State
Sum of Monthly_income
Sum of Number_of_dependents
District
Select all
Bardhaman
Agartala
Bhavnagar
Agra
Bhiwandi
Ahmedabad
Bulandshahr
Alappuzha
Buxar
Amravati
Dhule
Q&A
Ask a question about your data
Try one of these to get started
average cibil score
State
Street/Locality
City/Town_pincode
Andhra Pradesh
Acharya Circle
Hyderabad 489103
Andhra Pradesh
Agarwal Road
Muzaffarnagar 521
Andhra Pradesh
Aggarwal Chowk
Bidar-202336
Andhra Pradesh
Aggarwal Marg
Mehsana-037678
Andhra Pradesh
Aggarwal Marg
Rewa-700485
Andhra Pradesh
Aggarwal Path
Thiruvananthapura
Count of Employment_status by Fraud_type and Gender
Gender
Female
Male
Other
Fraud_type
Synthetic Identity
Income Misrepres...
Loan Stacking
Transaction Laun...
Count of Employment_status


Count of Customer id and First Loan type by Cibil score and Fraud flag
Increase
Decrease
Total
Other
Count of Customer_id and First ...
Cibil_score
All Loan amount requested and Monthly income by House and Loan status
1M (7.25%)
3M (17.22%)
3M (18.11%)
2M (9.82%)
4M (20.52%)
4M (24.34%)
House
00/04
00/27
00/02
00/00
00/029
00/52
Count of Purpose of loan
33.23K (33.23%)
33.47K (33.47%)
33.3K (33.3%)
Property_ownership_status
Jointly Owned
Rented
Owned

PROJECT 3: CONSUMER COMPLAINTS DASHBOARD (MAJOR PROJECT)

Project Overview

Objective: Develop a comprehensive Power BI dashboard for analyzing customer complaints, tracking KPIs, and providing actionable insights for service improvement and compliance monitoring.

Comprehensive BI Solution

Dashboard Architecture:

1. **Home Page:** Executive navigation and KPI summary
2. **Overview Dashboard:** High-level complaint metrics and distributions
3. **Product & Issue Drill-Down:** Hierarchical analysis capabilities
4. **Company Response Analysis:** Resolution effectiveness evaluation
5. **Time & Performance Dashboard:** Trend analysis and geographical insights

Advanced Data Modeling:

- **Star Schema Design:** Fact table (Complaints) with dimension tables (Product, Issue, Date)
- **ETL Process:** Power Query for data cleaning and transformation
- **Advanced DAX:** Complex measures for KPIs and performance metrics

Key Performance Indicators:

Primary KPIs:

- **Total Complaints:** Comprehensive volume tracking
- **Average Resolution Delay:** Time-based performance measurement
- **Timely Response Rate:** Service level compliance monitoring

Secondary Metrics:

- Channel-wise complaint distribution
- State-wise complaint mapping
- Product category performance analysis
- Resolution type effectiveness

Major Insights Discovered:

Channel Analysis:

- Web submissions dominate complaint channels (primary digital preference)
- Phone and email serve as secondary channels
- Channel preferences vary by complaint type and urgency

Product Performance:

- Checking/Savings Accounts generate highest complaint volumes
- Credit Cards represent significant complaint category
- Sub-product analysis reveals specific pain points

Geographic Distribution:

- California records maximum state-level complaints
- Regional patterns indicate service quality variations
- Urban vs rural complaint distribution analysis

Resolution Effectiveness:

- ~65% of complaints closed with explanations
- Only ~50% resolved within defined timelines
- Resolution delays indicate process improvement opportunities

Advanced Visualization Features:

- **Interactive Maps:** State-wise complaint distribution
- **Treemaps:** Product hierarchy visualization
- **Heatmaps:** Time-based pattern analysis
- **Drill-Through Capabilities:** Product to sub-product to issue analysis
- **KPI Cards:** Executive-level performance monitoring

Strategic Recommendations:

Operational Improvements:

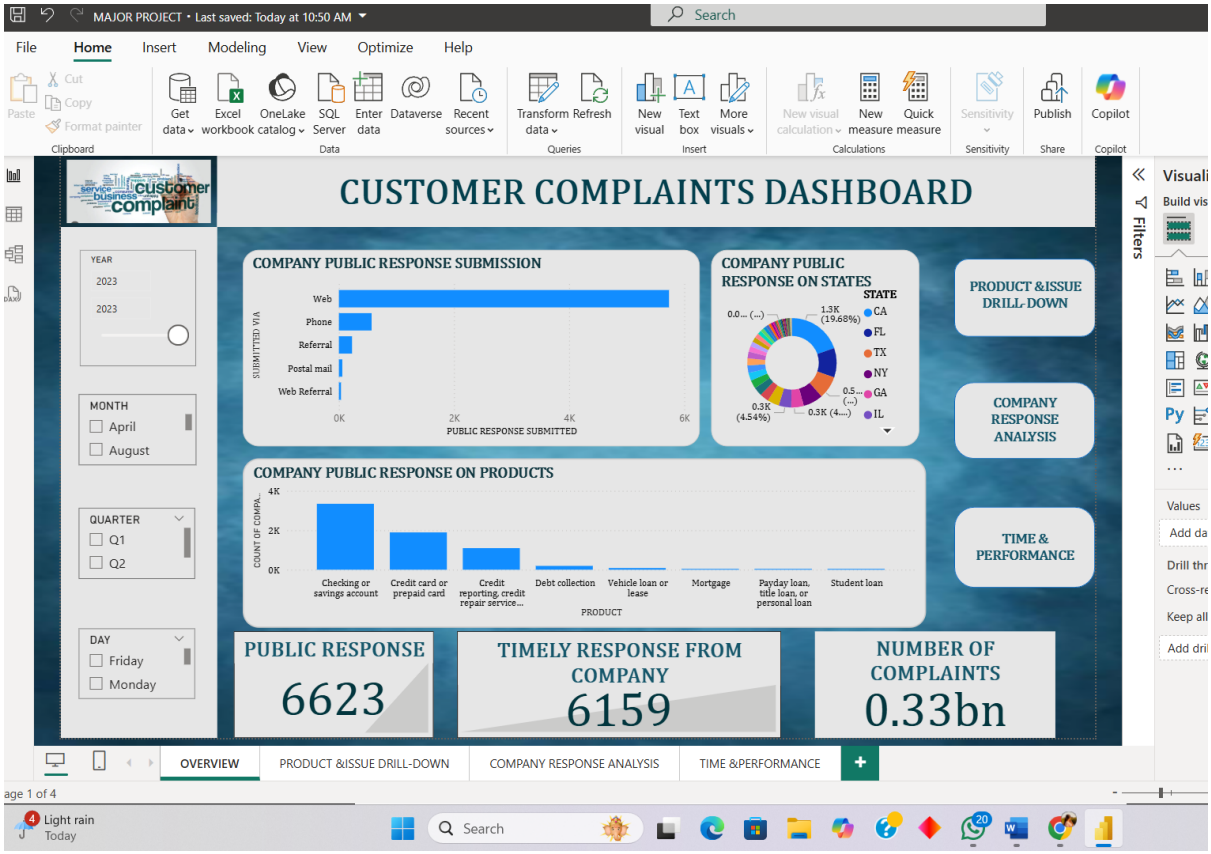
- Enhance digital complaint handling systems (web priority)
- Improve timely response rates to increase customer trust
- Allocate resources to high-complaint products and regions

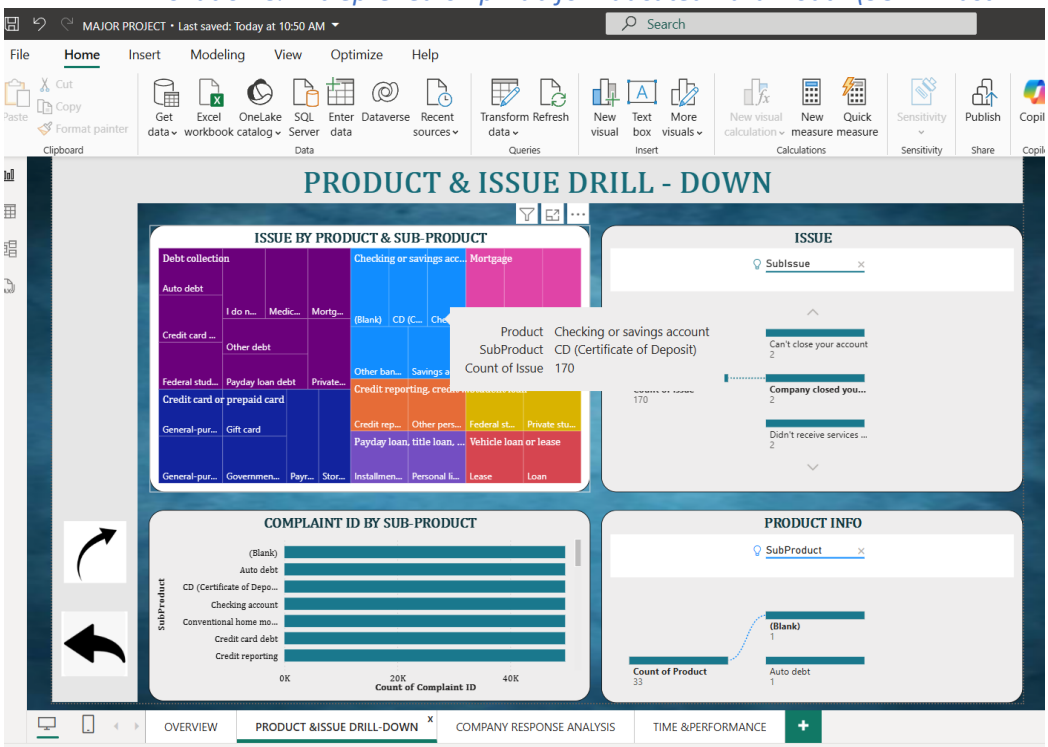
Resource Allocation:

- Focus on Checking Accounts and Credit Cards improvement
- Strengthen California operations and similar high-volume states
- Train customer service teams using data-driven insights

System Enhancements:

- Implement real-time monitoring capabilities
- Develop predictive analytics for complaint forecasting
- Integrate sentiment analysis for deeper insights




MAJOR PROJECT • Last saved: Today at 10:50 AM
Search
File
Home
Insert
Modeling
View
Optimize
Help
PRODUCT & ISSUE DRILL - DOWN
ISSUE BY PRODUCT & SUB-PRODUCT
Debt collection
Auto debt
Credit card ...
Other debt
Federal stud...
Payday loan debt
Credit card or prepaid card
General-pur...
Gift card
Checking or savings acc...
Mortgage
Other ban...
Savings a...
Credit reporting, cred...
Credit rep...
Other pers...
Federal st...
Private stu...
Payday loan, title loan, ...
Vehicle loan or lease
Installmen...
Personal li...
Lease
Loan
Product Checking or savings account
SubProduct CD (Certificate of Deposit)
Count of Issue 170
ISSUE
SubIssue
Can't close your account
Company closed you...
Didn't receive services ...
COMPLAINT ID BY SUB-PRODUCT
SubProduct
(Blank)
Auto debt
CD (Certificate of Depo...
Checking account
Conventional home mo...
Credit card debt
Credit reporting
Count of Complaint ID
PRODUCT INFO
SubProduct
Count of Product
Auto debt
OVERVIEW
PRODUCT &ISSUE DRILL-DOWN
COMPANY RESPONSE ANALYSIS
TIME &PERFORMANCE
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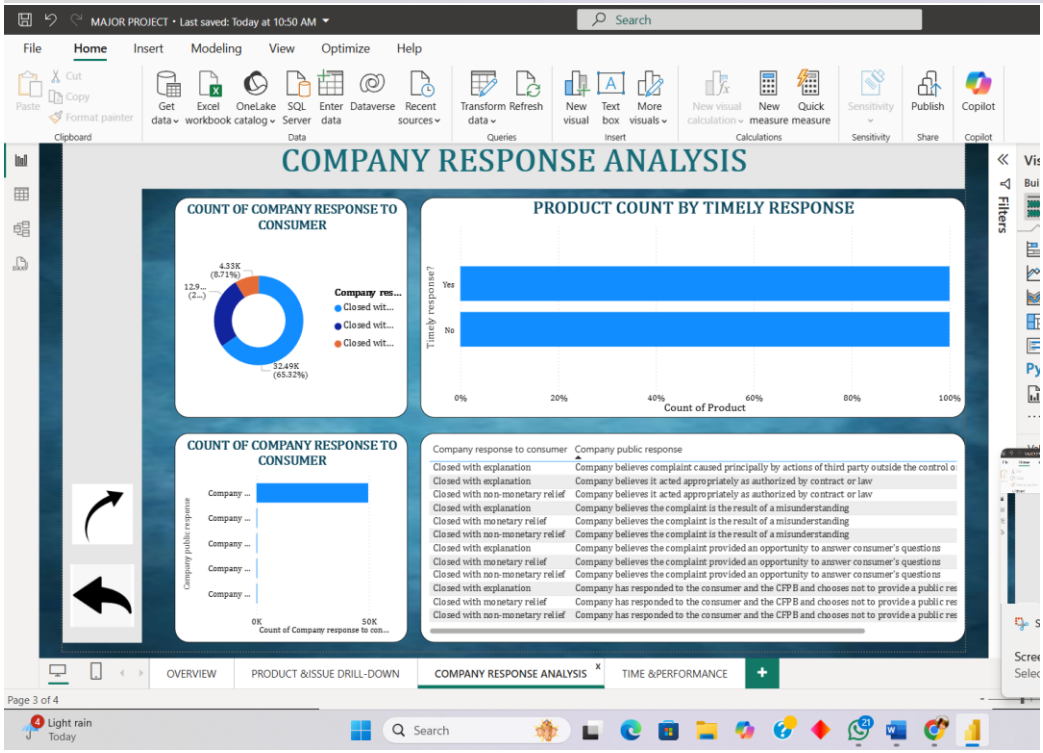
MAJOR PROJECT • Last saved: Today at 10:50 AM
Search
File
Home
Insert
Modeling
View
Optimize
Help
COMPANY RESPONSE ANALYSIS
COUNT OF COMPANY RESPONSE TO CONSUMER
Company res...
Closed wit...
PRODUCT COUNT BY TIMELY RESPONSE
Timely response?
Yes
No
Count of Product
COUNT OF COMPANY RESPONSE TO CONSUMER
Company public response
Count of Company response to con...
Company response to consumer
Company public response
Closed with explanation
Company believes complaint caused principally by actions of third party outside the control o
Closed with explanation
Company believes it acted appropriately as authorized by contract or law
Closed with non-monetary relief
Company believes it acted appropriately as authorized by contract or law
Closed with explanation
Company believes the complaint is the result of a misunderstanding
Closed with monetary relief
Company believes the complaint is the result of a misunderstanding
Closed with non-monetary relief
Company believes the complaint is the result of a misunderstanding
Closed with explanation
Company believes the complaint provided an opportunity to answer consumer's questions
Closed with monetary relief
Company believes the complaint provided an opportunity to answer consumer's questions
Closed with non-monetary relief
Company believes the complaint provided an opportunity to answer consumer's questions
Closed with explanation
Company has responded to the consumer and the CFPB and chooses not to provide a public res
Closed with monetary relief
Company has responded to the consumer and the CFPB and chooses not to provide a public res
Closed with non-monetary relief
Company has responded to the consumer and the CFPB and chooses not to provide a public res
OVERVIEW
PRODUCT &ISSUE DRILL-DOWN
COMPANY RESPONSE ANALYSIS
TIME &PERFORMANCE
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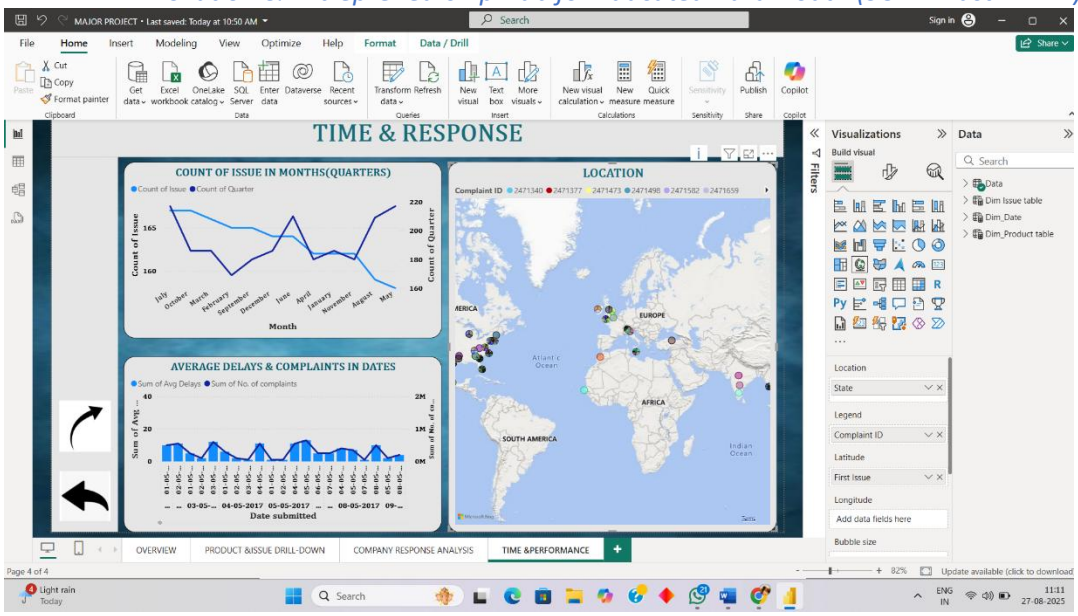

GITHUB REPOSITORY: https://github.com/Gopika-N-G/SQL-POWERBI-PROJECT-SURE-PROED

COMBINED LEARNING OUTCOMES

Technical Skills Acquired

Programming & Development:

- **Python Programming:** Object-oriented design, modular architecture
- **Database Operations:** MySQL administration, connection pooling, transaction management
- **API Integration:** Google Cloud APIs, authentication mechanisms, secure credential management

Business Intelligence:

- **Power BI Mastery:** Dashboard design, advanced visualizations, interactive features
- **Data Modeling:** Star schema design, fact and dimension table relationships
- **DAX Proficiency:** Complex measures, KPI calculations, performance metrics

Data Management:

- **ETL Processes:** Power Query for data cleaning and transformation
- **Data Validation:** Robust cleaning techniques, duplicate prevention
- **Configuration Management:** Environment-specific parameter handling

Analytical & Problem-Solving Skills:

System Architecture:

- Understanding of modular system design and separation of concerns
- Experience in integrating multiple cloud services and databases
- Knowledge of scalable solution development principles

Business Analysis:

- Ability to translate business requirements into technical solutions
- Experience in identifying patterns and insights from complex datasets
- Skills in presenting technical findings to business stakeholders

Project Management:

- End-to-end project delivery from design to deployment
- Independent problem-solving and debugging capabilities
- Documentation and knowledge transfer skills

SOCIAL & INDUSTRY IMPACT

Industry Applications

Educational Sector:

- **Google Forms Integration:** Streamlines feedback collection and analysis
- **Automated Processing:** Reduces manual administrative tasks
- **Real-time Insights:** Enables immediate response to student feedback

Financial Services:

- **Risk Assessment:** Enhanced loan approval decision-making
- **Fraud Detection:** Pattern-based risk identification
- **Regulatory Compliance:** Standardized evaluation processes

Customer Service:

- **Service Quality Monitoring:** Real-time complaint tracking
- **Resource Optimization:** Data-driven staff allocation
- **Customer Satisfaction:** Improved resolution processes

Social Benefits

Digital Transformation:

- Supports organizations in adopting automated data processing
- Reduces manual labor and increases productivity
- Ensures accurate and consistent data collection

Employment Enhancement:

- Demonstrates practical skills relevant to modern workplace
- Shows capability in emerging technologies and tools
- Provides portfolio evidence for potential employers

Rural Youth Empowerment:

- Bridges gap between academic knowledge and industry requirements
- Provides hands-on experience with professional-grade tools
- Enhances employability in technology sector

Technical Community Contribution:

- Open-source code repositories for community learning
- Documented methodologies for similar implementations
- Best practices sharing for API integration and BI development

FUTURE SCOPE & RECOMMENDATIONS

Technical Enhancements

Google Forms Integration Project:

- **Multi-Database Support:** Extend to PostgreSQL, MongoDB, and other systems
- **Real-Time Processing:** Implement webhook-based synchronization
- **Web Dashboard:** Create browser-based monitoring interface
- **Containerization:** Docker-based deployment for scalability

Bank Loan Analysis Project:

- **Machine Learning Integration:** Predictive fraud detection models
- **Real-Time Data Integration:** Live loan application monitoring
- **Advanced Analytics:** Customer segmentation and risk scoring
- **Mobile Dashboard:** Quick decision-making tools for loan officers

Consumer Complaints Project:

- **Sentiment Analysis:** AI-powered feedback interpretation
- **Predictive Analytics:** Complaint volume forecasting
- **Real-Time Monitoring:** Live complaint tracking and alerts
- **Mobile Application:** Executive monitoring and management tools

Platform Evolution

Cloud Deployment Options:

- **Infrastructure:** AWS, Azure, Google Cloud Platform deployment
- **Microservices:** Convert monolithic applications to microservices architecture
- **CI/CD Pipeline:** Automated testing and deployment processes
- **API Development:** RESTful APIs for external system integration
- **API Development:** RESTful APIs for external system integration

Business Applications:

- **SaaS Platform:** Convert solutions to Software-as-a-Service offerings
- **Enterprise Integration:** Connect with ERP and CRM systems
- **Industry-Specific Solutions:** Customized solutions for healthcare, retail, telecom

- **Data Lake Integration:** Connect with big data processing platforms

Strategic Recommendations

For Organizations:

1. **Adopt Automation:** Implement similar solutions for process automation
2. **Invest in BI:** Use business intelligence for data-driven decision making
3. **Train Staff:** Develop internal capabilities in modern data tools
4. **Scale Solutions:** Expand successful pilots to enterprise-wide implementations

for Educational Institutions:

1. **Curriculum Integration:** Include practical BI projects in academic programs
2. **Industry Partnerships:** Collaborate with companies for real-world projects
3. **Tool Access:** Provide students access to professional-grade software
4. **Mentorship Programs:** Connect students with industry professionals

For Rural Development:

1. **Digital Literacy:** Expand programs teaching modern technology skills
2. **Remote Opportunities:** Enable rural youth to work on global projects
3. **Entrepreneurship**: Support tech-based startups in rural areas
4. **Infrastructure Development:** Improve internet connectivity for technology access

THANK YOU