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

Automation of Forms to MySQL DB with Global sales report in Power BI

The domain of the Project:

SQL AND POWER BI

Team Mentors (and their designation): Mrs. Siddhika Shah (Software Engineer)

By

Mr. Shashikant Kumar M.Sc. in Mathematics and Computing Final year pursuing---- Team Leader

Period of the project

April 2025 to August 2025

SURE TRUST

PUTTAPARTHI, ANDHRA PRADESH

Declaration

The project titled **"Automation of forms to MySQL DB with Global sales reports in power BI"** 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. I declare that to the best of my knowledge the members of the team mentioned below, have worked on it successfully and enhanced their practical knowledge in the domain.

By: **Signature:**

Name: Shashikant Kumar Shashikant Kumar

MSc in Mathematics and computing

Mentors: **Signature:**

Ms Siddhika Shah Software Engineer at HCL Technologies

Seal & Signature:

Prof. Radha Kumari

Executive Direct & Founder

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Executive Summary

This report showcases a comprehensive data visualization project designed to enhance decision-making and operational efficiency through interactive Power BI dashboards.

➢ Global Sales Dashboard (Major Project – Power BI)

The objective of this project was to analyse global sales performance and profitability using Power BI. The dataset was cleaned, transformed, and modelled to create dynamic dashboards that deliver insights into sales, profit, customer segments, categories, and regional performance.

The dashboards provide real-time visibility into key business metrics such as sales volume, profit trends, payment modes, and customer segments. Advanced visualizations highlight category-wise and sub-category-wise performance, monthly sales/profit trends, and regional variations. Additionally, the dashboards enable drill-down analysis by time, geography, and product, supporting management in strategic decision-making.

Key Findings:

1. A few high-performing categories and sub-categories contribute significantly to overall revenue.
2. Regional variations in sales and profit reveal opportunities for targeted strategies.
3. Consumer and corporate segments drive the majority of sales, while home office has relatively lower contribution.
4. Seasonal and monthly sales fluctuations indicate demand forecasting opportunities.

Recommendations:

1. Prioritize investment in high-demand categories and profitable sub-categories.
2. Implement region-specific strategies to strengthen underperforming areas.
3. Enhance demand forecasting to improve inventory and supply chain efficiency.
4. Monitor payment mode preferences to align promotions and improve customer experience.

➢ Ecommerce Sales Report (Mini Project – Power BI)

This mini-project focused on analysing e-commerce sales performance through interactive Power BI dashboards. Key business metrics such as sales amount, profit, quantity, average order value (AOV), and customer contributions were visualized to uncover insights into product categories, payment preferences, and regional sales distribution.

Key Findings:

1. Clothing emerged as the dominant category, contributing the highest share of sales quantity.
2. COD (Cash on Delivery) remained the most preferred payment mode, followed by UPI and Debit Card.
3. Uttar Pradesh and Rajasthan were leading states in terms of sales amount, highlighting strong regional demand.
4. Printers and Bookcases generated the highest profitability among sub-categories.

Recommendations:

1. Focus on high-performing product categories like Clothing and Electronics to drive future growth.
2. Explore strategies to encourage digital payment adoption, reducing COD dependency.
3. Leverage strong-performing regions with targeted marketing campaigns, while developing strategies for weaker markets.
4. Expand and promote profitable sub-categories such as Printers to maximize returns.

➢ Google Forms to MySQL Automation (SQL Project)

This project streamlined the process of collecting responses from Google Forms and directly transferring them into a MySQL database. The automation removed the need for manual entry, minimized data entry errors, and ensured instant data availability for analysis and reporting.

Key Outcomes:

1. Enhanced productivity through automated response collection.
2. Achieved smooth integration of form data with reporting and analytics systems.

Recommendations:

1. Broaden automation to cover additional input sources.
2. Set up regular backups and monitoring to maintain long-term data accuracy and reliability.

Introduction

Background

In today's fast-paced business landscape, organizations increasingly depend on data-driven insights to improve efficiency, optimize resources, and boost profitability. The retail and e-commerce sectors, in particular, produce large volumes of sales and customer data that must be analysed and presented effectively to support strategic decision-making.

The projects completed — **Global Sales Dashboard (Power BI), Ecommerce Sales Dashboard (Power BI), and Google Forms to MySQL Automation (SQL Project)** — were developed to meet this requirement. Together, these projects encompass data gathering, storage, automation, and visualization, ensuring that decision-makers have access to accurate, timely, and actionable insights in a clear and interactive format.

Problem statement or goals of the project

1. Global Sales Dashboard (Major Project):
The absence of a consolidated reporting framework made it challenging to track sales performance, evaluate profitability, and identify regional or product-level trends.

Goal: Develop an interactive Power BI dashboard to analyse global sales, customer segments, and category-wise performance, supporting strategic decision-making.

2. Ecommerce Sales Dashboard (Minor Project):
The e-commerce business required deeper insights into customer purchases, payment preferences, and category contributions but lacked an efficient reporting solution.

Goal: Design a Power BI dashboard that visualizes sales amount, profit distribution, payment mode usage, and regional performance to guide marketing and sales strategies.

3. Google Forms to MySQL Automation (SQL Project):
Manually transferring Google Form responses into the database was inefficient, error-prone, and delayed data availability.

Goal: Implement an automated pipeline to capture and store Google Form responses directly into a MySQL database, ensuring real-time accuracy and accessibility.

Scope and limitations of the project

Global Sales Dashboard (Major Project – Power BI)

Scope:

- Development of an interactive Power BI dashboard to analyze global sales, profit, and customer segments.
- Visualization of category-wise, sub-category-wise, and regional sales performance.
- Identification of seasonal demand trends and forecasting opportunities.
- Support for strategic decisions in inventory planning, marketing, and profitability optimization.

Limitations:

- Analysis limited to the available dataset; results depend on the completeness and accuracy of provided data.
- Dashboard insights do not include predictive analytics or external market factors.
- Requires periodic data refresh for real-time accuracy.

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2. Ecommerce Sales Dashboard (Minor Project – Power BI)

Scope:

- Creation of a Power BI dashboard to evaluate e-commerce sales performance.
- Analysis of product categories, payment modes, and customer contributions.
- Regional performance tracking for identifying high- and low-demand states.
- Insights to support marketing and sales decision-making.

Limitations:

- Focused only on sales data; excludes logistics, supply chain, or customer service aspects.
- Historical data analysis only, with no machine learning or predictive modeling.
- Limited to the scope of given transactional data; external factors influencing sales are not captured.

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3. Google Forms to MySQL Automation (SQL Project)

Scope:

- Automation of Google Form responses directly into a MySQL database.
- Elimination of manual data entry errors and delays.
- Real-time availability of form data for analytics and reporting.
- Foundation for integration with other data visualization tools.

Limitations:

- Designed only for Google Forms; other input sources require additional integration.
- Dependent on stable internet connectivity and database server availability.
- Does not include advanced data validation or transformation beyond basic capture.

Innovation component

✓ **Automated Data Integration:**
The automation of Google Form responses into MySQL establishes a smooth data pipeline, eliminating manual intervention and ensuring timely, reliable, and error-free information flow for analytics.

✓ **Insightful Visualization:**
Power BI dashboards convert raw transactional data into dynamic, user-friendly visuals, simplifying the interpretation of sales performance, customer patterns, and product trends for both technical and non-technical users.

✓ **Strategy-Oriented Reporting:**
Rather than focusing solely on numerical reporting, the dashboards emphasize KPIs, trends, and recommendations that directly align with business objectives and guide strategic decision-making.

✓ **Scalability and Adaptability:**
The combined frameworks of Power BI and MySQL automation can be scaled to other organizational domains, including HR, finance, supply chain, and customer service, ensuring long-term usability and flexibility.

Project Objectives

Global Sales Dashboard (Major Project – Power BI)

Objectives & Goals:

1. Design an interactive Power BI dashboard to analyse global sales and profitability.
2. Identify high-performing categories, customer segments, and regional sales variations.
3. Deliver actionable insights to support management in inventory planning, marketing, and revenue optimization.

Expected Outcomes & Deliverables:

1. A comprehensive Power BI dashboard showcasing KPIs such as sales, profit, category trends, and regional performance.
2. Analytical reports highlighting revenue opportunities, demand fluctuations, and customer behaviour.
3. Strategic recommendations for improving forecasting accuracy and driving profitability.

Ecommerce Sales Dashboard (Minor Project – Power BI)

Objectives & Goals:

1. Evaluate e-commerce sales performance across categories, payment modes, and regions.
2. Compare contribution of different customer segments and product lines.
3. Provide insights to strengthen sales strategies and regional marketing efforts.

Expected Outcomes & Deliverables:

1. An interactive Power BI dashboard with metrics on sales, profit, payment preferences, and category performance.
2. Reports detailing top-performing products, profitable sub-categories, and state-wise sales trends.
3. Recommendations to enhance regional marketing strategies and promote high-profit categories.

Google Forms to MySQL Automation (SQL Project)

Objectives & Goals:

1. Automate the process of storing Google Form responses directly into a MySQL database.
2. Remove inefficiencies and errors caused by manual data entry.
3. Ensure real-time access to accurate, structured data for reporting and analytics.

Expected Outcomes & Deliverables:

1. An automated pipeline connecting Google Forms with MySQL for seamless data transfer.
2. A centralized, reliable database with up-to-date responses.
3. Documentation of the workflow for scalability, monitoring, and future enhancements.

Methodology and Results

1. Global Sales Dashboard (Major Project – Power BI)

Methods / Technology Used

- **Data Preparation & Analysis:**
    1. Sales records imported and cleaned using Excel/CSV.
    2. Power Query in Power BI used for transformation and establishing table relationships (Customers, Products, Regions, Sales).
    3. DAX (Data Analysis Expressions) applied to compute KPIs such as sales growth, profit margins, and revenue contribution.
- **Tools / Software Used:**
    1. **Power BI –>** Data modelling, dashboard design, and visualization.
    2. **Excel/CSV** –> Raw data storage and preprocessing.
    3. **GitHub** –> For maintaining documentation and version control.
- **Data Collection Approach:**
  Dataset sourced from structured retail sales data files (Excel/CSV format).
- **Project Architecture:**
    1. **Data Source** → (CSV/Excel)
    2. **Data Cleaning & Transformation** → (Power Query)
    3. **Data Modelling** → (Relationships among Customers, Products, Regions, and Sales)
    4. **Visualization** → (Power BI dashboards with KPIs, charts, slicers)
    5. **Reports & Insights** → (Supporting management decisions).

Results:

- Identified top-performing products and profitable categories.
- Revealed regional sales variations and seasonal demand spikes.
- Helped management optimize inventory planning and marketing strategies.

2. Ecommerce Sales Dashboard (Minor Project – Power BI)

Methods / Technology Used

- **Data Preparation & Analysis:**
    1. E-commerce sales data imported from CSV/Excel files.
    2. Data transformed and modelled in Power BI for category, payment, and region-based analysis.
    3. DAX used to calculate KPIs such as total sales, profit, and average order value (AOV).
- **Tools / Software Used:**
    1. **Power BI** –> For dashboard creation and visualization.
    2. **Excel/CSV** –> For storing and preprocessing data.
    3. **GitHub** –> For project documentation and backup.
- **Data Collection Approach:**
  Dataset included e-commerce transaction details with sales, quantity, profit, customer, and regional attributes.
- **Project Architecture:**
    1. **Data Source** → (CSV/Excel)
    2. **Data Cleaning & Transformation** → (Power Query in Power BI)
    3. **Data Modelling** → (Relationships among Sales, Customers, Products, and Regions)
    4. **Visualization** → (Interactive dashboard with KPIs, filters, and charts)
    5. **Reports & Insights** → (Guiding e-commerce business strategy).

Results:

- Clothing emerged as the most sold category, while printers and bookcases provided higher profitability.
- COD (Cash on Delivery) was identified as the most preferred payment mode.
- Uttar Pradesh and Rajasthan stood out as leading states in sales contribution.
- Recommendations suggested regional marketing expansion and increased promotion of profitable categories.

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3. Google Forms to MySQL Automation (SQL Project)

Methods / Technology Used

- **Automation Workflow:**
    1. User submits data through Google Form.
    2. Responses stored in Google Sheets (default backend).
    3. Integrated automation (via Pebbly/Apps Script) pushes responses into MySQL.
    4. SQL queries used for data validation, cleaning, and structuring.
    5. Database connected with BI tools for reporting and analysis.
- **Tools / Software Used:**
    1. **Google Forms** – For data collection.
    2. **Google Sheets** – For storing responses temporarily.
    3. **MySQL Database** – For structured and centralized storage.
    4. **Pabbly / Google Apps Script** – For automation pipeline.
    5. **GitHub** – For project documentation and version control.
- **Data Collection Approach:**
  Real-time data collected directly through Google Forms (feedback/survey type inputs).
- **Project Architecture:**
    1. **User Input** → (Google Form)
    2. **Temporary Storage** → (Google Sheets)
    3. **Automated Transfer** → (Pabbly/Apps Script)
    4. **Structured Storage** → (MySQL Database)
    5. **Data Validation** → (SQL Queries)
    6. **Reporting** → (BI tools for analysis).

Results:

- Manual entry eliminated, saving time and reducing errors.
- Real-time data availability enabled faster reporting and decision-making.
- Created a scalable pipeline that can be extended to other data sources.

Flow: *Data Source → Data Processing → Dashboard → Insights*

- Final Major project working screenshots along with supporting explanation

Figure 1: Global Sales Dashboard

➢ Global Sales Dashboard Overview

This figure presents the **Global Sales Dashboard**, which provides a consolidated view of sales performance across regions, product categories, customer segments, and payment modes. It enables executives and stakeholders to track key sales metrics, monitor trends, and identify growth opportunities.

➢ Key Performance Indicators (KPIs)

The top section highlights important KPIs:

- **Sum of Sales**: *$1.57M*, representing total revenue generated.
- **Sum of Quantity***: 22K* units sold, reflecting overall product movement.

- **Average Delivery Time***: 3.93 days*, indicating operational efficiency.
- **Sum of Profit**: *$175.26K*, showcasing overall profitability.

➢ Sales by Category

A horizontal bar chart breaks down sales by major product categories:

- **Office Supplies***: $0.64M* (largest contributor).
- **Technology**: *$0.47M*.
- **Furniture**: *$0.45M.*
  This reveals that **Office Supplies dominate overall sales**, followed closely by Technology and Furniture.

➢ Sales and Profit by State

A geo-map visualization shows the **distribution of sales and profits across U.S. states**. Larger blue bubbles highlight high-performing states, indicating regional concentration of revenue and profit.

➢ Profit by Month and Year

A line chart compares monthly profit trends for **2019 vs 2020**. The dashboard shows fluctuations, with notable peaks in April, October, and December, suggesting **seasonal demand surges**.

➢ Sales by Month and Year

Another line chart tracks total monthly sales for **2019 and 2020**. Sales demonstrate steady growth, with significant increases toward the year-end, highlighting strong **Q4 performance**.

➢ Sales by Payment Mode

A donut chart presents the share of payment methods:

- **Cash on Delivery (COD): 42.62%** (most used).

- **Online: *35.38%*.**
- **Cards: *21.99%*.**
  This suggests a **customer preference for COD**, but also a strong presence of digital transactions.

➢ Sales by Segment

Another donut chart highlights sales distribution by customer segments:

- **Consumer: *48.09%*** (dominant segment).
- **Corporate: *32.55%*.**
- **Home Office: *19.35%*.**
  This shows that **Consumer sales are the largest driver of revenue**.

➢ Sales by Sub-Category

A horizontal bar chart breaks down performance of top-selling sub-categories:

- **Phones*: $0.20M*.**
- **Chairs: *$0.18M*.**
- **Binders: *$0.17M*.**
- **Storage*: $0.15M*.**
- **Accessories: *$0.12M*.**
  Phones lead as the **most profitable sub-category**, followed by office furniture items and accessories.

➢ Insights & Value

This dashboard provides a **360° overview of sales performance**, enabling:

- Monitoring of sales and profit trends over time.
- Identifying high-performing regions and product categories.

- Understanding customer preferences by segment and payment mode.
- Supporting **data-driven strategic decisions** for boosting revenue and efficiency.

Figure 2: MTD Report of Global Sales

➢ Global Sales Dashboard – Office Supplies (2020)

This figure provides a consolidated analysis of sales performance for **Office Supplies** in the year **2020**, segmented by key performance indicators (KPIs), time, and region.

➢ Key Performance Indicators (KPIs)

- **Sum of Sales**: $457.35K, reflecting the total revenue generated from office supplies.
- **Sum of Quantity**: 8K units sold, indicating overall product movement.
- **Average Delivery Time**: 3.95 days, highlighting logistics efficiency.
- **Sum of Profit**: $39.42K, representing net profitability for the selected category.

➢ Filters & Segmentation

- **Region Filters**: Central, East, South, and West regions can be analysed individually.

- **Time Filters**: Data can be explored across months (January–December).
- **Category Filter**: This view specifically focuses on **Office Supplies**, but the dashboard supports other categories such as Technology and Furniture.

➢ MTD (Month-to-Date) by Year, Quarter, Month, and Day

The line chart at the bottom track's **sales trends throughout 2020**:

- **Early 2020**: Sales started modestly but displayed steady monthly increases.
- **Quarterly Spikes**: Noticeable peaks appear at the start of each quarter (March, June, September, December), followed by dips, indicating cyclical sales patterns.
- **End of Year Surge**: A sharp increase in sales is observed in November and December, suggesting **seasonal demand and year-end business purchases**.

➢ Insights

- **Consistent Growth**: Despite fluctuations, sales show a rising trend, peaking toward the year-end.
- **Regional Comparison**: The top filter allows executives to drill down and compare performance across different regions.
- **Operational Efficiency**: An average delivery time of 3.95 days indicates effective order fulfilment, though improvements could further optimize performance.
- **Profit Margins**: With sales at $457.35K and profit at $39.42K, the category maintains modest margins, suggesting opportunities for cost optimization.

This dashboard view offers executives **a focused performance analysis of Office Supplies in 2020**, highlighting revenue growth patterns, delivery efficiency, and profitability.

- Final Minor project working screenshots along with supporting explanation.

Figure 3: E-commerce Sales

➢ Ecommerce Sales Dashboard

This figure presents the **Ecommerce Sales Dashboard**, which provides a consolidated view of performance across states, customer segments, product categories, and payment modes. It allows stakeholders to track sales quantity, profit, and revenue while identifying trends, customer preferences, and high-performing regions.

Key Performance Indicators (KPIs)

The top section highlights critical business metrics:

- **Sum of Quantity***: 6K* units sold, reflecting overall product movement.
- **Sum of Amount***: ₹438K*, representing total sales revenue generated.
- **Sum of Profit:** *₹37K*, indicating business profitability.
- **Average Order Value (AOV):** *₹121.014K*, showcasing customer spending patterns.

Sales by State

A horizontal bar chart displays state-level sales distribution:

- **Uttar Pradesh** leads in total sales amount.
- Followed by **Rajasthan** and **West Bengal**.
- Tamil Nadu and Sikkim contribute smaller portions.
  This reveals strong performance in northern states, with potential for expanding sales in underperforming regions.

Profit by Month

A bar chart illustrates monthly profit trends:

- Highest profits observed in **January, March, and December**.
- Losses recorded during **June, July, and August**, indicating off-season dips.
  This suggests seasonal demand variations that businesses can prepare for with targeted promotions.

Sales by Customer Name

A bar chart ranks top customers:

- **Harivansh and Madhav** emerge as leading contributors.
- Others such as **Madan Mohan, Shiva, and Vishakha** follow.
  This helps in identifying key customers and focusing on loyalty strategies.

Sales by Payment Mode

A donut chart highlights payment preferences:

- **Cash on Delivery (COD):** *43.74%* (most preferred).
- **UPI:** *20.61%.*
- **Debit Card:** *13.2%.*
- **Credit Card:** *11.97%.*
- **EMI:** *10.49%.*
  This indicates COD dominance, but also a significant shift toward digital transactions like UPI.

Sales by Category

A donut chart breaks down sales by product categories:

- **Clothing:** *62.62%* (largest share).
- **Electronics:** *20.55%.*
- **Furniture:** *16.83%.*
  This shows that clothing dominates e-commerce sales, while electronics and furniture also contribute substantially.

Profit by Sub-Category

A bar chart highlights profit distribution across sub-categories:

- **Printers** lead with the highest profitability.
- **Bookcases** and **Sarees** follow as profitable segments.
- **Accessories and Tables** contribute smaller but notable profits.

Geographical Distribution

A geo-map visualization presents the spread of sales across Indian states. Blue dots highlight major sales regions, providing spatial insights into customer base concentration.

Insights & Value

This dashboard provides a 360° view of e-commerce performance, enabling:

- Tracking of sales, profit, and revenue across time and regions.
- Identifying high-performing states and product categories.
- Understanding customer buying patterns and payment preferences.
- Recognizing seasonal sales fluctuations for better planning.

Google Forms → MySQL Automation:

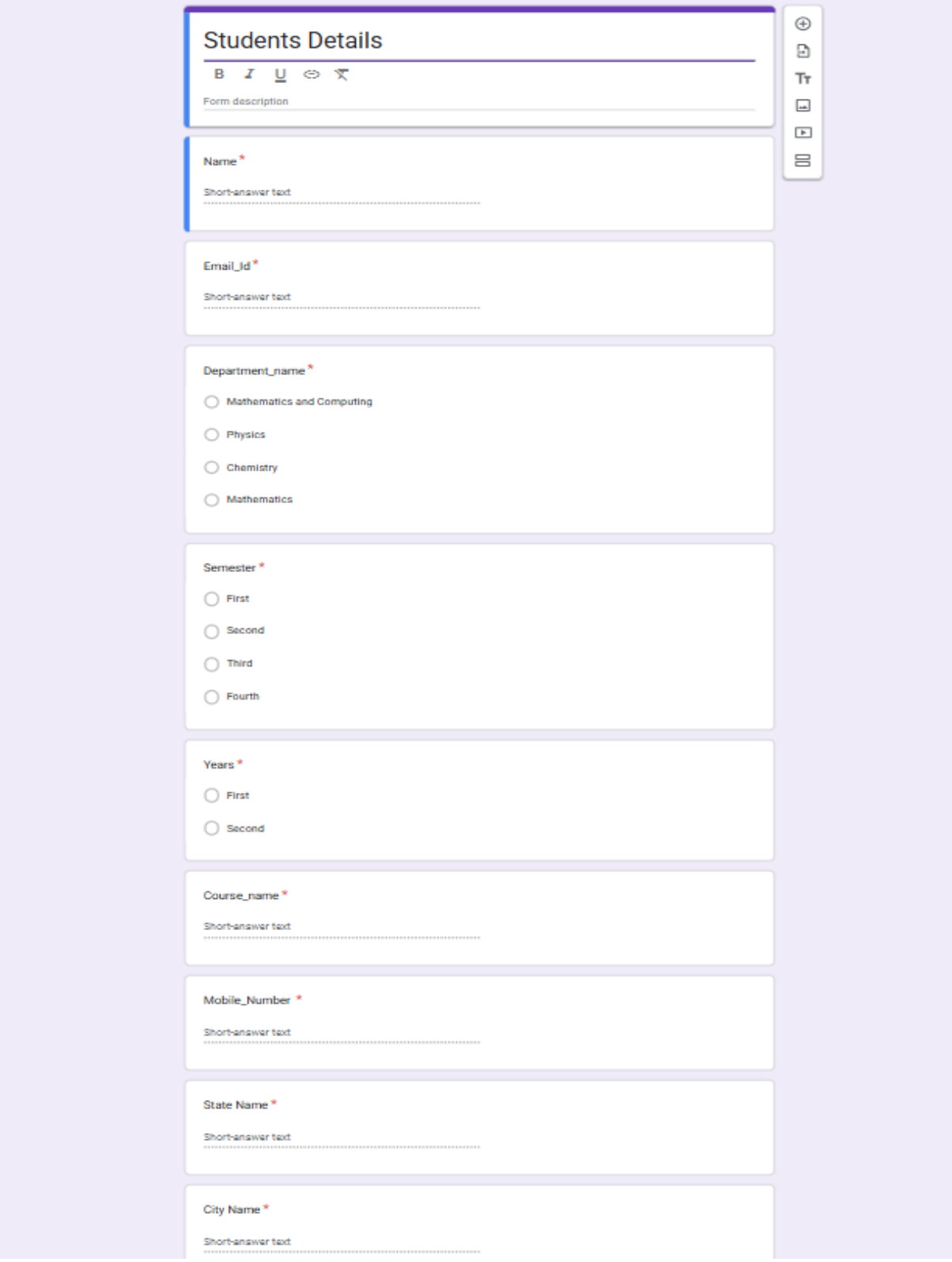

Figure 4: Google Forms

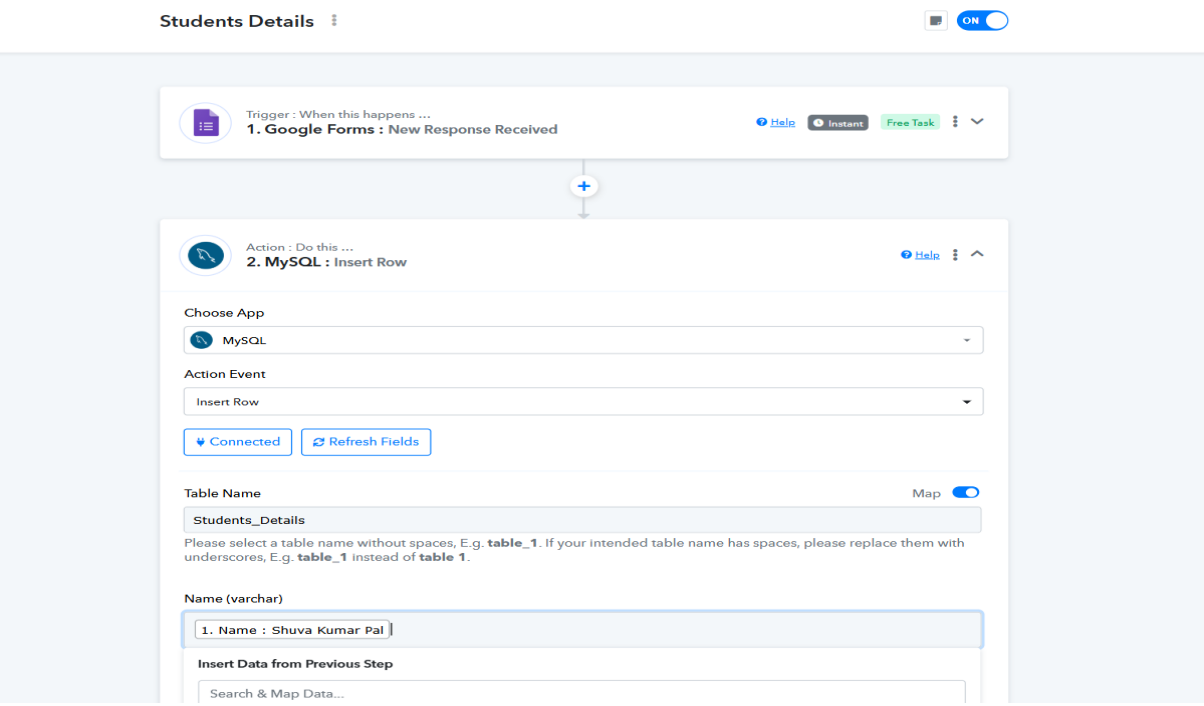

Figure 4: Integration of Google forms and MySQL

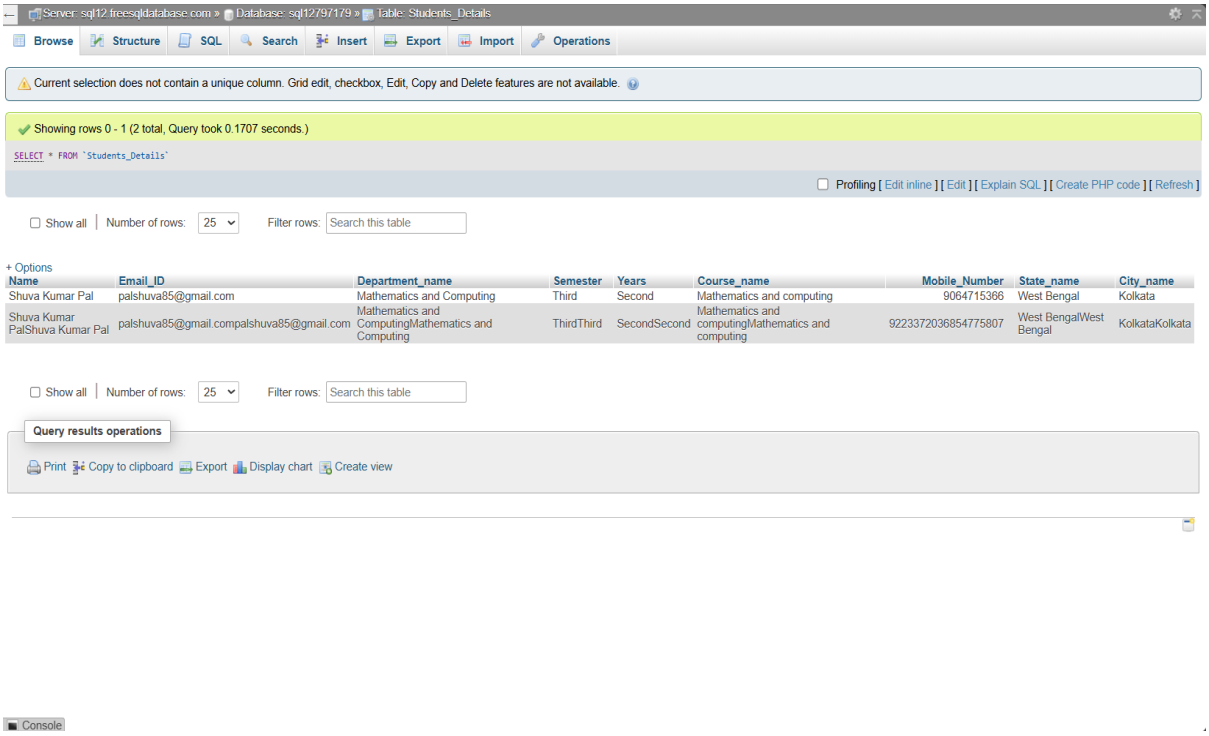

Figure 5: Integrated MySQL Database

Project GitHub Link: https://github.com/SHASHIKANT2912/SQL-and-Power-BI-Project.git

Learning and Reflection

Power BI & Data Visualization

1. Learned how to clean, transform, and model structured datasets using **Power Query** in Power BI.
2. Developed practical skills in **DAX functions** to create KPIs, calculated fields, and business measures.
3. Enhanced ability to design **interactive dashboards** that communicate insights in a professional, decision-friendly format.
4. Understood the importance of **visual storytelling** to simplify complex sales and customer data for executives.

Database Management (MySQL)

1. Strengthened conceptual and hands-on knowledge of **relational database design** and SQL querying.
2. Gained experience in **automating data entry** from Google Forms directly into MySQL, improving speed and accuracy.
3. Learned how to perform **data validation, cleaning, and structuring** to prepare datasets for analytics and reporting.
4. Improved understanding of **data integrity** and best practices in maintaining reliable databases.

Automation & Integration

1. Acquired knowledge of **automation pipelines**, connecting tools like Google Forms, Google Sheets, and MySQL seamlessly.
2. Understood how automation eliminates repetitive manual tasks, **reduces errors**, and ensures real-time data updates.
3. Learned to integrate **third-party connectors and scripts** to enhance system efficiency and scalability.

Project Management & Documentation

1. Improved **time and task management skills** by setting milestones, breaking down complex tasks, and adhering to deadlines.

2. Gained experience in **documentation**, ensuring that methods, processes, and findings were clearly recorded for future use.
3. Learned the value of **version control (GitHub)** for maintaining project files and enabling collaborative improvement.
4. Reflected on how systematic planning and execution improve both the **quality and reliability** of analytics projects.

Overall experience

Working on these projects independently provided me with valuable **end-to-end exposure** to real-world data analytics, reporting, and automation. I gained hands-on experience across the full workflow — from **data collection and storage** to **dashboard design, visualization, and process automation**.

These projects helped me bridge the gap between **theoretical learning** and **practical implementation**, particularly in:

1. **Sales Analytics** → extracting insights from raw datasets and identifying trends across products, customers, and regions.
2. **Decision-Making Support** → designing interactive dashboards that highlight key KPIs and enable data-driven strategies.
3. **Database Automation** → building pipelines that transfer Google Form responses directly into MySQL, reducing errors and ensuring real-time availability.

Overall, the projects significantly enhanced my **technical, analytical, and problem-solving skills** while also strengthening my ability to work independently and manage project timelines. They gave me the confidence to take on larger, industry-level challenges involving **data visualization, business intelligence, and automation frameworks**.

Conclusion and Future Scope

Conclusion

- **Recap of Objectives and Achievements**

The primary objectives of this set of projects were to:

1. Develop interactive sales dashboards (Ecommerce Sales and Awesome Chocolates) in **Power BI** to analyse sales performance, customer behaviour, and profitability trends.
2. Automate the process of collecting responses from **Google Forms into MySQL** to improve efficiency, accuracy, and real-time data availability.

Achievements:

1. Successfully created and deployed **Power BI dashboards** that visualize KPIs such as revenue, profit, product performance, regional sales, and customer preferences.
2. Designed and implemented an **automation pipeline** to seamlessly transfer Google Form responses into MySQL, reducing manual workload and minimizing data-entry errors.
3. Provided **actionable insights and recommendations** to support better sales planning, inventory management, and marketing strategies.
4. Strengthened technical expertise in **Power BI, SQL, DAX, database management, and automation tools**, bridging the gap between academic learning and real-world applications.

Future Scope

This work can be expanded and enhanced in the following directions:

1. **Advanced Analytics & Forecasting**
    - Use Python/R to apply machine learning models for sales forecasting, trend analysis, and customer segmentation.
2. **Integration with Cloud Platforms**
    - Store and manage data on **cloud databases** (AWS RDS, Azure SQL, or Google Cloud SQL) for scalability, collaboration, and global access.

3. **Real-Time Dashboards**
    - Connect live data streams (APIs, IoT devices, or streaming services) to Power BI to provide continuous, real-time updates.
4. **Expansion to Other Business Areas**
    - Apply similar BI frameworks to **HR analytics, financial planning, and supply chain management**, enabling cross-departmental insights.
5. **Mobile-Friendly Dashboards**
    - Optimize Power BI reports for **mobile platforms**, enabling executives to monitor KPIs anytime, anywhere.
6. **Machine Learning Integration**
    - Enhance dashboards with **AI-driven insights**, such as customer sentiment analysis from reviews, recommendation engines, and anomaly detection.