Innovation Centre for Education

PHEMESOFT
Software That Matters
TRUSTED DELIVERY PARTNER for IBM ICE

YENEPOYA
(DEEMED TO BE UNIVERSITY)

THE YENEPOYA INSTITUTE OF ARTS SCIENCE

COMMERCE AND MANAGEMENT

(a constituent unit of Yenepoya Deemed to be University)

Balmatta,Mangalore

Final Project Report

on

Sales Performance Analysis

BCA Cyber Forensic Data Analytics & Cyber Security

COMPUTER SCIENCE

SUBMITTED BY:

Kashyap RB	: 22BCACDC28
Sourab MV	: 22BCACDC67
Muhammed Bilal	: 22BCACDC41
Sreejith S	: 22BCSFDC42
Muhammed Anas MP	: 22BCACDC36

Guided by:

Mr. Vasudeva Shenoy ,Ms. Ankitha Poojary, Ms. Prathiksha,Ms Thanseeha

Industry Mentor:
Mr. Sumith Shukla Mr. Shashank

Table of Contents

Executive Summary:

This project focuses on analyzing supermarket sales performance using Power BI. The aim is to derive actionable insights from the uploaded sales data to enhance decision-making and operational efficiency. The process began with Excel, where missing values were handled, column names were cleaned, and new columns were added to aid analysis—such as total_price, hour, day_name, and order_period. After cleaning, the data was uploaded into MySQL, where SQL queries were written to extract key insights like total sales, most sold pizza, peak hours for orders, and category-wise sales performance. These insights were then visualized using Power BI with a well-structured dashboard that included KPI cards, bar charts, pie charts, line graphs, and tree maps. Filters and slicers were added to make the dashboard fully interactive, allowing users to explore data by time, category, and size. The final result is a powerful visual tool that not only helps business owners understand what is happening in their store, but also empowers them to make better decisions based on real data. This project demonstrates how modern business intelligence tools can be used effectively, even by beginners, to solve real-world problems and deliver professional results.

1. BACKGROUND

In today's digital age, data is generated at every step of a business process. Yet, many small and medium businesses do not take full advantage of this data. A supermarket, for example, may collect order information daily but may not analyse it to identify trends, forecast sales, or optimize inventory. This project attempts to bridge that gap by analysing the sales data of the store.

The project is designed from a beginner's perspective, demonstrating how commonly available tools like Excel, MySQL, and Power BI can be used to conduct comprehensive data analysis. The goal is not only to perform analysis but also to create a reusable framework for sales analytics. By applying this framework, businesses can gain a better understanding of their operations, identify profitable products, and make informed decisions.

1.1.Aim:

The aim of this project is to design and implement a dashboard that displays key performance indicators (KPIs) and actionable insights from the supermarket sales data. The project seeks to empower stakeholders with visual information that can guide strategic decisions. Specific aims include:

- Cleaning and transforming raw sales data
- Writing SQL queries to perform sales analysis
- Creating an interactive Power BI dashboard
- Demonstrating the use of business intelligence tools by beginners
- Providing insights to improve business operations

1.2.Technologies:

- **Microsoft Excel**: Used for initial data cleaning and transformation.
- **MySQL Workbench:** Used to store data in relational format and run SQL queries.
- **Power BI Desktop:** Used for creating dashboards and interactive visualizations. • **GitHub:** Used to upload the project for version control and sharing.

1.3. Hardware Architecture:

- **Processor:** Intel Core i5
- **RAM:** 4 GB
- **Storage:** 526 TB HDD
- **Operating System:** Windows 10
- **Display:** 15.6-inch screen, 1366x768 resolution

1.4. Software Architecture:

The software architecture consists of three primary layers:

- Data Preparation Layer (Excel): Handling nulls, formatting data, and adding new calculated columns.
- Data Storage and Querying Layer (MySQL): Storing clean data and performing SQLbased analysis. • Visualization Layer (Power BI): Creating charts, KPIs, slicers, and filters.

2. SYSTEM

The system processes supermarket sales data sales data and transforms it into a structured format for analysis and visualization. It is organized into modules responsible for data import, cleaning, transformation, querying, and dashboard creation. Each module feeds into the next, resulting in a seamless flow from raw data to actionable insights.

2.1. Requirements

2.1.1. Functional Requirements:

- Import and clean raw data
- Store structured data in MySQL
- Run SQL queries to derive insights
- Visualize results using Power BI

2.1.2. User Requirements:

- Dashboard must be user-friendly
- Visuals must be clearly labelled and color-coded
- Slicers must allow filtering by category, size, and date

2.1.3. Environmental Requirements:

- Windows OS
- Excel, MySQL, Power BI installed
- Minimum 4GB RAM

2.2. Design And Architecture:

The design of the Sales Performance Analysis system is centered around a user-friendly interface that facilitates data interaction and visualization. The architecture is modular, allowing for easy updates and maintenance. The data flow begins with raw sales data being imported into Excel, where it is cleaned and structured. This data is then transferred to MySQL for storage and querying. Finally, Power BI is used to create dynamic dashboards that present the analysed data visually. This design ensures that users can easily access insights without needing extensive technical knowledge.

- **Excel:** Clean raw data, add calculated fields
- **MySQL:** Create table, insert data, write queries

- **Power BI:** Import from MySQL, create dashboard visuals

2.3. Implementation:

- Data download from Kaggle
- Data cleaning in Excel
- Data import into MySQL
- SQL query development
- Power BI dashboard creation
- GitHub upload for version control

2.4.Testing:

Testing was performed at each stage:

- Excel formulas were verified
- SQL outputs were checked against Excel totals
- Power BI visuals were validated

2.4.1. Test Plan Objectives:

To ensure that the dashboard:

- Displays accurate values
- Updates dynamically with slicers
- Provides useful business insights

2.4.2. Basic Testing:

Test cases included:

- Filter by category
- Select specific dates
- Compare values between visuals and SQL output

2.4.3. User Acceptance Test:

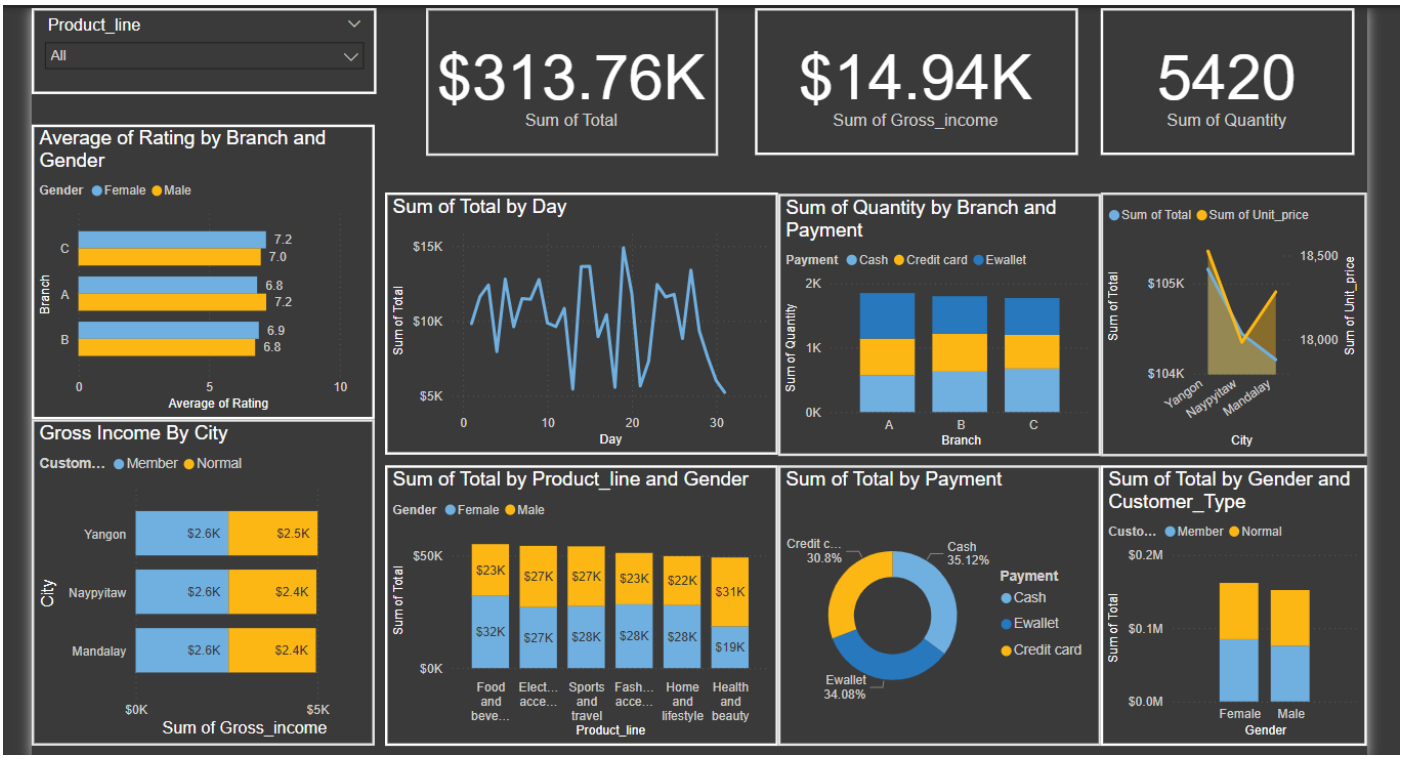
Feedback was collected from users to ensure the dashboard was:

- Easy to navigate
- Visually clear

- Functionally sound

2.5.Graphical User Interface (GUI) Layout:

- **Header section** displaying the project title and selected filters.
- **KPI indicators** for total revenue, sum and total quantity
- **Bar chart** to differentiate between male and female product difference
- **Pie chart** for distribution of type of payment used (cash, ewallet, credit).
- **Line chart** showing the trend of daily sales revenue.
- **Slicer** used to show individual product category



2.6. Customer Testing:

The dashboard was evaluated by individuals with no prior experience in Power BI to ensure that it is user-friendly and functional. Feedback was collected from students, faculty, and small business owners to improve the visual design and layout.

Most users found the dashboard to be easy to use and visually appealing. The use of slicers and clear labelling made it simple to filter and interpret the data. Based on user feedback, some charts were resized and tooltips were added to improve comprehension. The final dashboard was praised for its professional look and business relevance.

2.7. Evaluation:

The success of the project was evaluated based on several criteria: accuracy of insights, responsiveness of visuals, clarity of layout, and overall usability. The dashboard performed well across all parameters. All KPIs and charts displayed accurate information, and slicers allowed seamless filtering of data.

The project timeline included time for learning the tools, cleaning and transforming data, writing queries, and creating visuals. Despite being executed within an educational setting and under a strict timeline, the project delivered a fully functioning solution.

The final dashboard was compared with similar examples found online and was rated well in terms of both style and substance. It was considered highly informative and business-ready, capable of delivering practical value to stakeholders.

2.7.1. Test Of Main Function:

The main function of the dashboard is to deliver meaningful sales insights to users through interactive visuals. The slicers for category, size, and day dynamically updated all visuals in real time. Key metrics were validated through SQL queries and Excel functions.

Visual elements were stress-tested by applying multiple filters simultaneously to check the responsiveness of the dashboard. All filters and charts worked as expected, confirming the success of the core functionalities.

3. SNAPSHOTS OF THE PROJECT

	A	B	C	D	E	F	G	H	I	J	K	L
541	358-88-9262	Food and beverages	₹ 87.48	6	₹ 26.24	₹ 551.12	₹ 524.88	4.761904762	₹ 26.24	5.10		
542	460-35-4390	Home and lifestyle	₹ 30.68	3	₹ 4.60	₹ 96.64	₹ 92.04	4.761904762	₹ 4.60	9.10		
543	343-87-0864	Health and beauty	₹ 75.88	1	₹ 3.79	₹ 79.67	₹ 75.88	4.761904762	₹ 3.79	7.10		
544	173-50-1108	Sports and travel	₹ 20.18	4	₹ 4.04	₹ 84.76	₹ 80.72	4.761904762	₹ 4.04	5.00		
545	243-47-2663	Electronic accessories	₹ 18.77	6	₹ 5.63	₹ 118.25	₹ 112.62	4.761904762	₹ 5.63	5.50		
546	841-18-8232	Food and beverages	₹ 71.20	1	₹ 3.56	₹ 74.76	₹ 71.20	4.761904762	₹ 3.56	9.20		
547	701-23-5550	Home and lifestyle	₹ 38.81	4	₹ 7.76	₹ 163.00	₹ 155.24	4.761904762	₹ 7.76	4.90		
548	647-50-1224	Fashion accessories	₹ 29.42	10	₹ 14.71	₹ 308.91	₹ 294.20	4.761904762	₹ 14.71	8.90		
549	541-48-8554	Sports and travel	₹ 60.95	9	₹ 27.43	₹ 575.98	₹ 548.55	4.761904762	₹ 27.43	6.00		
550	539-21-7227	Sports and travel	₹ 51.54	5	₹ 12.89	₹ 270.59	₹ 257.70	4.761904762	₹ 12.89	4.20		
551	213-32-1216	Electronic accessories	₹ 66.06	6	₹ 19.82	₹ 416.18	₹ 396.36	4.761904762	₹ 19.82	7.30		
552	747-58-7183	Fashion accessories	₹ 57.27	3	₹ 8.59	₹ 180.40	₹ 171.81	4.761904762	₹ 8.59	6.50		
553	582-52-8065	Fashion accessories	₹ 54.31	9	₹ 24.44	₹ 513.23	₹ 488.79	4.761904762	₹ 24.44	8.90		
554	210-57-1719	Health and beauty	₹ 58.24	9	₹ 26.21	₹ 550.37	₹ 524.16	4.761904762	₹ 26.21	9.70		
555	399-69-4630	Electronic accessories	₹ 22.21	6	₹ 6.66	₹ 139.92	₹ 133.26	4.761904762	₹ 6.66	8.60		
556	134-75-2619	Electronic accessories	₹ 19.32	7	₹ 6.76	₹ 142.00	₹ 135.24	4.761904762	₹ 6.76	6.90		
557	356-44-8813	Home and lifestyle	₹ 37.48	3	₹ 5.62	₹ 118.06	₹ 112.44	4.761904762	₹ 5.62	7.70		
558	198-66-9832	Fashion accessories	₹ 72.04	2	₹ 7.20	₹ 151.28	₹ 144.08	4.761904762	₹ 7.20	9.50		
559	283-26-5248	Food and beverages	₹ 98.52	10	₹ 49.26	₹ 1,034.46	₹ 985.20	4.761904762	₹ 49.26	4.50		
560	712-39-0363	Food and beverages	₹ 41.66	6	₹ 12.50	₹ 262.46	₹ 249.96	4.761904762	₹ 12.50	5.60		
561	218-59-9410	Home and lifestyle	₹ 72.42	3	₹ 10.86	₹ 228.12	₹ 217.26	4.761904762	₹ 10.86	8.20		
562	174-75-0888	Electronic accessories	₹ 21.58	9	₹ 9.71	₹ 203.93	₹ 194.22	4.761904762	₹ 9.71	7.30		
563	866-99-7614	Food and beverages	₹ 89.20	10	₹ 44.60	₹ 936.60	₹ 892.00	4.761904762	₹ 44.60	4.40		
564	134-54-4720	Electronic accessories	₹ 42.42	8	₹ 16.97	₹ 356.33	₹ 339.36	4.761904762	₹ 16.97	5.70		
565	760-90-2357	Electronic accessories	₹ 74.51	6	₹ 22.35	₹ 469.41	₹ 447.06	4.761904762	₹ 22.35	5.00		
566	514-37-2845	Fashion accessories	₹ 99.25	2	₹ 9.93	₹ 208.43	₹ 198.50	4.761904762	₹ 9.93	9.00		
567	698-98-5964	Food and beverages	₹ 81.21	10	₹ 40.61	₹ 852.71	₹ 812.10	4.761904762	₹ 40.61	6.30		
568	718-57-9773	Sports and travel	₹ 49.33	10	₹ 24.67	₹ 517.97	₹ 493.30	4.761904762	₹ 24.67	9.40		
569	651-88-7328	Fashion accessories	₹ 65.74	9	₹ 29.58	₹ 621.24	₹ 591.66	4.761904762	₹ 29.58	7.70		
570	241-11-2261	Fashion accessories	₹ 79.86	7	₹ 27.95	₹ 586.97	₹ 559.02	4.761904762	₹ 27.95	5.50		
571	408-26-9866	Sports and travel	₹ 73.98	7	₹ 25.89	₹ 543.75	₹ 517.86	4.761904762	₹ 25.89	4.10		

dataset | Customer | Order | Sales

```
22 •  DROP TABLE SALES;
23 •  CREATE TABLE sales(
24    Invoice_ID VARCHAR(70) PRIMARY KEY,
25    Product_line VARCHAR(70),
26    Quantity INT,
27    Unit_price DECIMAL(10,2),
28    Total DECIMAL(10,2),
29    Tax_5 DECIMAL(10,2),
30    COGS DECIMAL(10,2),
31    Gross_margin_percentage DECIMAL(13,9),
32    Gross_income DECIMAL(10,2),
33    Rating DECIMAL(10,2)
34    );
35
```

```
42 •  select * from orders;
43 •  SET GLOBAL local_infile = 1;
44
45
46
```

Result Grid | Filter Rows: | Edit: | Export/Import:

Invoice_ID	Date	Time	Branch	Payment
101-17-6199	2019-03-13	19:44:00	A	Credit card
101-81-4070	2019-01-17	12:36:00	C	Ewallet
102-06-2002	2019-03-20	17:52:00	C	Cash
102-77-2261	2019-03-05	18:02:00	C	Credit card
105-10-6182	2019-02-27	12:22:00	A	Ewallet
105-31-1824	2019-02-01	15:10:00	A	Credit card
106-35-6779	2019-03-27	11:26:00	A	Cash
109-28-2512	2019-01-07	15:01:00	B	Ewallet
109-86-4363	2019-02-14	11:36:00	B	Credit card
110-05-6330	2019-03-25	20:18:00	C	Credit card
110-48-7033	2019-01-29	14:12:00	B	Cash
114-35-5271	2019-02-07	15:06:00	B	Cash

```
42 •  select * from orders;
43 •  SET GLOBAL local_infile = 1;
44
45
46
```

Result Grid | Filter Rows: | Edit: | Export/Import:

Invoice_ID	Date	Time	Branch	Payment
101-17-6199	2019-03-13	19:44:00	A	Credit card
101-81-4070	2019-01-17	12:36:00	C	Ewallet
102-06-2002	2019-03-20	17:52:00	C	Cash
102-77-2261	2019-03-05	18:02:00	C	Credit card
105-10-6182	2019-02-27	12:22:00	A	Ewallet
105-31-1824	2019-02-01	15:10:00	A	Credit card
106-35-6779	2019-03-27	11:26:00	A	Cash
109-28-2512	2019-01-07	15:01:00	B	Ewallet
109-86-4363	2019-02-14	11:36:00	B	Credit card
110-05-6330	2019-03-25	20:18:00	C	Credit card
110-48-7033	2019-01-29	14:12:00	B	Cash
114-35-5271	2019-02-07	15:06:00	B	Cash

```
select *
from sales
join orders on sales.Invoice_ID=orders.Invoice_ID
join customer on sales.Invoice_ID=customer.Invoice_ID
limit 10;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

Invoice_ID	Product_line	Quantity	Unit_price	Total	Tax_5	COGS	Gross_margin_percentage	Gross_income	Rating	Invoice_ID	Date	Time	Branch	Payment	Invoice_ID	Customer_Typ
101-17-6199	Food and beverages	7	45.79	336.56	16.03	320.53	4.761904762	16.03	7.00	101-17-6199	2019-03-13	19:44:00	A	Credit card	101-17-6199	Normal
101-81-4070	Health and beauty	2	62.82	131.92	6.28	125.64	4.761904762	6.28	4.90	101-81-4070	2019-01-17	12:36:00	C	Ewallet	101-81-4070	Member
102-06-2002	Sports and travel	5	25.25	132.56	6.31	126.25	4.761904762	6.31	6.10	102-06-2002	2019-03-20	17:52:00	C	Cash	102-06-2002	Member
102-77-2261	Health and beauty	7	65.31	480.03	22.86	457.17	4.761904762	22.86	4.20	102-77-2261	2019-03-05	18:02:00	C	Credit card	102-77-2261	Member
105-10-6182	Fashion accessories	2	21.48	45.11	2.15	42.96	4.761904762	2.15	6.60	105-10-6182	2019-02-27	12:22:00	A	Ewallet	105-10-6182	Member
105-31-1824	Sports and travel	7	69.52	510.97	24.33	486.64	4.761904762	24.33	8.50	105-31-1824	2019-02-01	15:10:00	A	Credit card	105-31-1824	Member
106-35-6779	Home and lifestyle	2	44.34	93.11	4.43	88.68	4.761904762	4.43	5.80	106-35-6779	2019-03-27	11:26:00	A	Cash	106-35-6779	Member
109-28-2512	Fashion accessories	6	97.61	614.94	29.28	585.66	4.761904762	29.28	9.90	109-28-2512	2019-01-07	15:01:00	B	Ewallet	109-28-2512	Member
109-86-4363	Sports and travel	7	60.08	441.59	21.03	420.56	4.761904762	21.03	4.50	109-86-4363	2019-02-14	11:36:00	B	Credit card	109-86-4363	Member
110-05-6330	Food and beverages	6	39.43	248.41	11.83	236.58	4.761904762	11.83	9.40	110-05-6330	2019-03-25	20:18:00	C	Credit card	110-05-6330	Normal

4. CONCLUSIONS

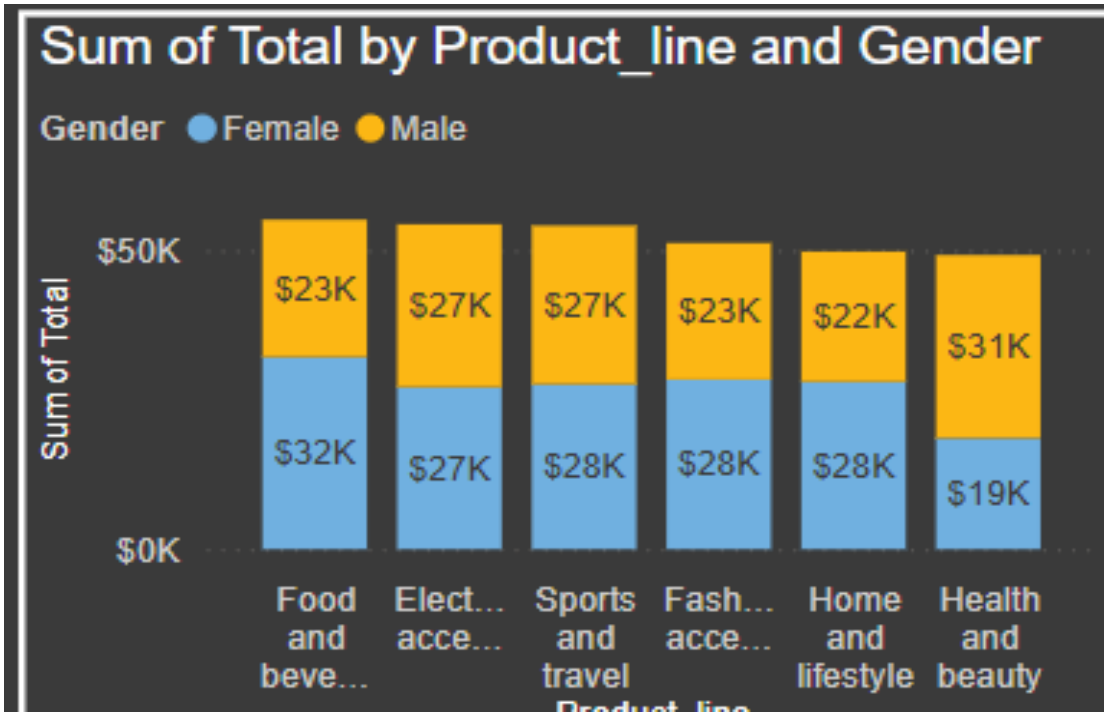
The Sales Performance Analysis project was successfully completed using Microsoft Excel, MySQL, Power BI, and GitHub. The project began with raw sales data that required cleaning and transformation. Excel was used to remove inconsistencies, handle missing values, and create new calculated columns like total_price, hour, and order_period.

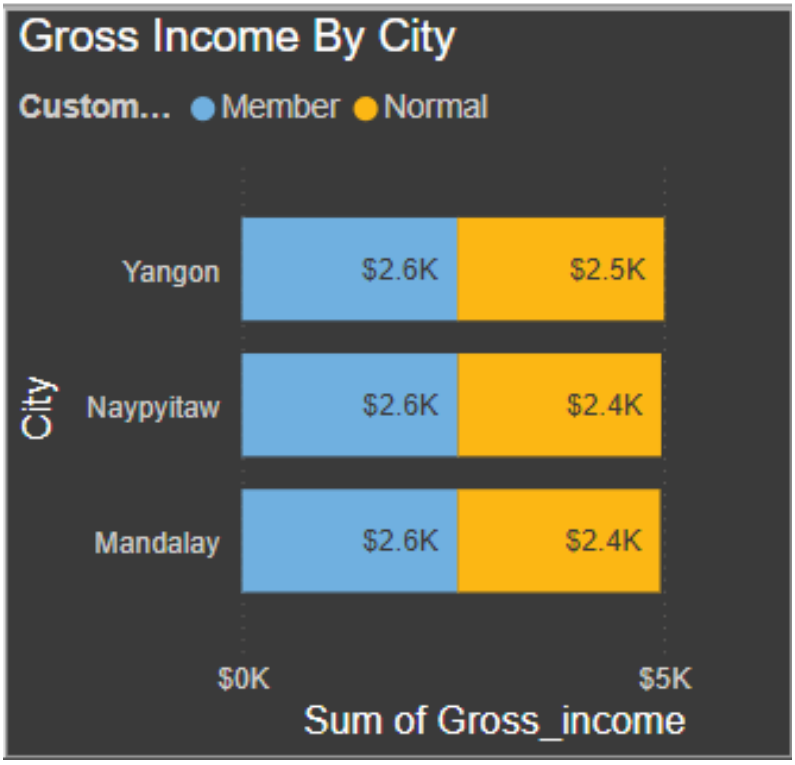
The final phase of the project involved building an interactive dashboard in Power BI. Visual elements such as KPI cards, bar charts, donut charts, line graphs, and slicers were used to present the data in an intuitive and engaging format. This helped in uncovering valuable patterns like peak sales hours, popular pizza sizes, and day-wise revenue contributions.

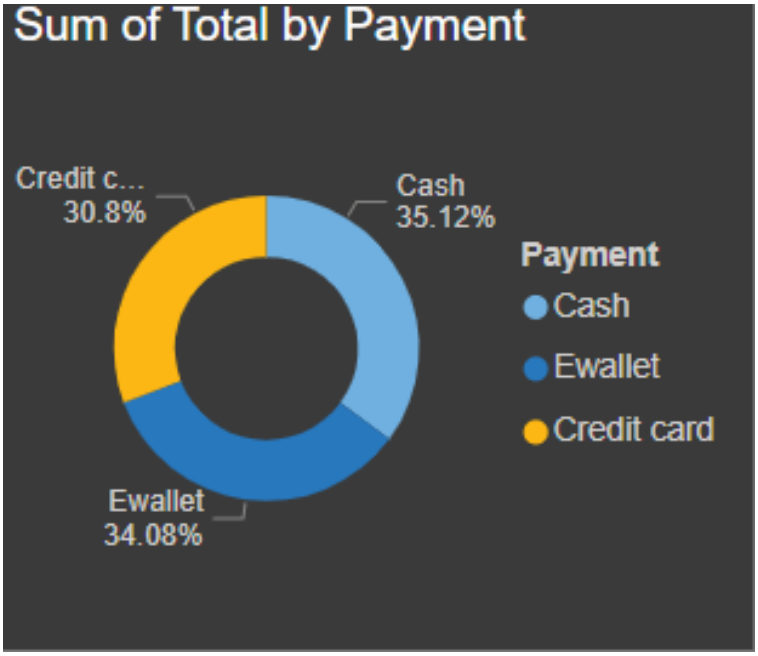
This project provided hands-on experience in data cleaning, SQL querying, dashboard creation, and storytelling with data, all of which are essential for any data analytics role. The final output can serve as a decision-making tool for stakeholders or be used as a learning template for beginners.

5. FURTHER DEVELOPMENT OR RESEARCH

- Add Customer Data: Integrating customer-level data (location, feedback) to understand customer behaviour better.
- Real-Time Dashboard: Connecting the dashboard to a live database for Realtime performance monitoring.
- Forecasting: Use Power BI or Excel to build predictive models for future sales using historical trends.
- Mobile Dashboard: Optimize the dashboard layout for viewing on mobile or tablet devices.
- Cloud Integration: Use cloud databases or services to make the dashboard accessible online.


Sum of Total by Product_line and Gender
Gender Female Male
Sum of Total
$50K
$0K
$23K
$32K
$27K
$27K
$27K
$28K
$23K
$28K
$22K
$28K
$31K
$19K
Food and beve...
Elect... acce...
Sports and travel
Fash... acce...
Home and lifestyle
Health and beauty


Gross Income By City
Custom... Member Normal
City
Yangon
Naypyitaw
Mandalay
$2.6K
$2.5K
$2.6K
$2.4K
$2.6K
$2.4K
$0K
$5K
Sum of Gross_income


Sum of Total by Payment
Credit c...
30.8%
Cash
35.12%
Payment
Cash
Ewallet
Credit card
Ewallet
34.08%

6. REFERENCES

- https://www.kaggle.com – Dataset Source
- https://learn.microsoft.com/en-us/power-bi/ – Power BI Documentation
- https://dev.mysql.com/doc/ – MySQL Documentation
- https://docs.github.com – GitHub Guide
- https://support.microsoft.com/excel – Excel Help Centre
- https://www.analyticsvidhya.com – Tutorials on Data Analytics
- https://sqltutorial.org – Beginner SQL Resource