Case Study of Pizza Planet

Mid-term Submission for the BDM capstone Project

Submitted by

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Contents

# 1. Executive Summary and Title

This report named **"Case Study of Pizza Planet"** presents the mid-term findings of the Business Data Management project on **Pizza Planet**, a new restaurant in Najibabad. The primary objective was to analyze operational data to uncover actionable insights for marketing and customer retention. The analysis is based on a dataset of **12,789 orders**, from which customer and sales data were systematically cleaned and examined.

The preliminary analysis reveals several critical insights. Firstly, business operations peak during the evening from **5 PM to 9 PM**, with **Saturday** being the busiest day. Secondly, a significant data gap exists, with customer information captured for only **45.43% of transactions**. Within this trackable group, a staggering **74% of unique customers have only ordered once**, highlighting a major opportunity to improve customer loyalty. The primary sales channel is **Dine In**, which generates the highest revenue at **₹1,716,743** from **6,900 orders**. Furthermore, cash is the dominant payment method, accounting for approximately **75% of all transactions**.

These findings confirm that while Pizza Planet has a strong in-person customer base, it faces significant challenges in customer retention and has an under-optimized delivery platform strategy. The insights form a data-driven foundation for developing targeted marketing campaigns and implementing a formal customer loyalty program to convert single-visit customers into a stable, recurring revenue base.

2. Proof Of Originality

2.1 Video Interaction with the Founder
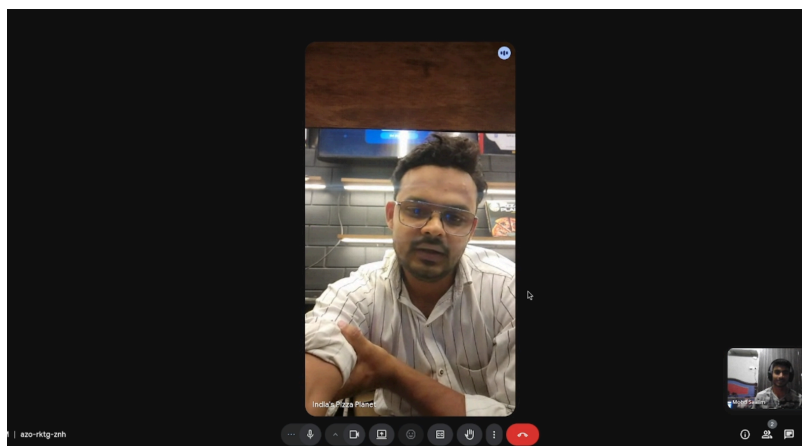
Link : 📹 *BDM Mid Term Report Video.mp4*

2.2 Letter from the restaurant owner

Pizza Planet - Pizza Restaurant

Adarsh Nagar, Najibabad, Uttar Pradesh 246763
+91 8937099008

Date: October 8, 2025

The Head of the Department,
Indian Institute of Technology Madras,
Chennai, Tamil Nadu - 600036

Subject: Proof of Data Provision for Business Data Management Project

Dear Sir/Madam,

This letter serves to confirm that Pizza Planet of Najibabad has authorized **Mr. Mohd Saalim (Roll No: 23f3000878)** to utilize our business's transactional data for his Business Data Management project at IIT Madras.

The data provided to Mr. Saalim is extracted from Pizza Planet's internal records, primarily from our Pet Pooja POS system and supplementary Excel logs. This data includes details such as invoice numbers, order dates, payment types, order platforms (Dine In, Zomato, Swiggy), and sales figures.

This data has been shared strictly for academic purposes upon his request. We hope this dataset will help him successfully complete his project and contribute meaningfully to his academic work.

If you require further information or confirmation, do not hesitate to get in touch.

Thank you.

Sincerely,

Mohd Faizan, Owner, Pizza Planet
+91 8937099008

Signature:

2.3 Images of the restaurant

3. Metadata

3.1 Origins and Description of the Data

The dataset used for this analysis is primary data derived from Pizza Planet's digitally stored transaction details. Order information is captured through their **Pet Pooja POS system** and supplementary **Excel logs**. The raw data contains daily transaction details such as the invoice number, date, order type, payment method, and the revenue generated per transaction. This structured dataset allows for a comprehensive analysis of sales trends, customer behavior, and platform performance.

Column Name	Data Type	Description
Invoice No.	String	A unique identifier for each transaction.
Date	Datetime	The full timestamp when the order was placed.
KOT No.	Integer	Kitchen Order Ticket number, unique to each order slip.
Payment Type	String	The method of payment used (e.g., 'Cash', 'Online').
Order Type	String	The nature of the order (e.g., 'Dine In', 'Delivery(Parcel)').
Platform	String	The consolidated sales channel (e.g., 'Dine In', 'Zomato', 'Swiggy'). This is a created column.
Phone	String	The customer's phone number, if provided.
Name	String	The customer's name, if provided.
Address	String	The customer's delivery address, if applicable.
My Amount (₹)	Float	The gross value of the items in the order before any discounts.
Discount (₹)	Float	The total value of discounts applied to the order.
Net Sales (₹)	Float	The revenue generated after discounts (My Amount - Discount).
Delivery Charge	Float	Additional charge for delivery, if applicable.
Container Charge	Float	Additional charge for packaging/containers.
Total Tax (₹)	Float	The total amount of tax applied to the order.
Round Off	Float	A small value added or subtracted to round the total bill.
Waived off	Float	Any amount that was waived from the final bill.
Total (₹)	Float	The final amount paid by the customer.
CustomerId	String	A unique identifier created from the phone number to track repeat visits. Can be null.
Loyal Customer	String	A flag ('Yes'/'No') to identify customers with more than three orders.
Month	String	The month the order was placed, extracted from the Date column.
DayOfWeek	String	The day of the week the order was placed, extracted from the Date column.
HourOfDay	Integer	The hour the order was placed (0-23), extracted from the Date column.

3.2 Data Cleaning and Preprocessing

To ensure the accuracy and consistency of the analysis, the original raw data was cleaned and preprocessed. The following steps were carried out:

i. Feature Engineering

- To enable deeper analysis, new columns were created from the existing data:

- **HourOfDay**, **DayOfWeek**, and **Month** were extracted from the **Date** column to facilitate

time-based analysis.

- A **CustomerId** column was generated from the **Phone** number field to allow for the tracking of unique and repeat customers.

- A **Loyal Customer** column was added using a formula to flag customers with more than three orders.

ii. Categorical Unification

- To create a single, reliable field for sales channel analysis, the **Order Type** and **Area** columns were consolidated into a standardized **Platform** column (e.g., combining "Delivery(Parcel)" and "Zomato" into a single "Zomato" entry).

iii. Outlier and Irrelevant Data Removal

- Unnecessary and redundant columns that were not relevant to the business problem were removed to simplify the dataset.

- Rows containing erroneous or outlier data were filtered out. For example, a few orders with ambiguous **Payment Type** labels like "Due paid" were removed to ensure the integrity of the payment analysis.

4. Descriptive Statistics

This section provides a detailed summary of the key characteristics of the Pizza Planet dataset. The statistics are derived from a total of **12,789** recorded orders and are broken down by customer behavior, platform performance, payment preferences, and sales timing to offer a multi-faceted view of the business.

4.1 Customer Loyalty Metrics

The analysis of customer loyalty immediately highlights a critical data collection gap and a low customer retention rate. A significant portion of transactions are anonymous, making it difficult to track repeat business.

- **Data Collection Rate:** Customer phone numbers, used to identify unique customers, were successfully captured for only **5,810** of the **12,789** orders, representing a tracking rate of just **45.43%**.

- **Customer Base:** Within this trackable cohort, there are **3,670** unique customers.

- **Retention Rate:** A vast majority of these unique customers (**2,711**, or **73.8%**) have only placed a single order. This underscores a significant challenge in converting new patrons into loyal customers.

- **Repeat Customers:** Consequently, only **959** unique customers (**26.2%**) have returned

for a second purchase or more.

Metric	Value
Total Orders Analyzed	12,789
Orders with Customer Phone Number	5,810
Number of Unique Trackable Customers	3,670
Customers with Only One Order	2,711
Customers with More Than One Order	959

4.2 Sales Performance by Platform

The restaurant's sales are predominantly driven by in-person dining. An analysis of Average Order Value (AOV) reveals differences in spending habits across platforms.

● **Revenue Share**: Dine In is the most valuable channel, contributing 54.3% of the total net sales. Zomato follows, accounting for 28.9%.

● **Average Order Value (AOV)**: Customers ordering via Zomato tend to have the highest AOV at ₹263.65, while Swiggy's AOV is the lowest.

Platform	Number of Orders	Net Sales (₹)	% of Total Sales	Average Order Value (₹)
Dine In	6,900	1,716,743.13	54.30%	₹248.80
Zomato	3,465	913,566.68	28.90%	₹263.65
Parcel	2,121	478,022.87	15.10%	₹225.38
Swiggy	303	52,912.90	1.70%	₹174.63

4.3 Payment Method Distribution

There is a strong and consistent preference for cash payments among Pizza Planet's customers across all observed months.

● **Cash vs. Online: Cash** was used in **9,575** transactions (**74.9%**), making it the dominant payment method. **Online** payments were used in only **3,214** transactions (**25.1%**). This trend holds true for every month analyzed, with cash orders significantly outnumbering online orders consistently.

Payment Type	Total Number of Orders	Percentage of Total

Cash	9,575	74.90%
Online	3,214	25.10%

4.4 Peak Business Times

The data shows clear and concentrated periods of high business activity, particularly during evening hours and on weekends.

- **Peak Hours:** The five-hour window from **5 PM to 9 PM (17:00-21:00)** is the "golden period" for the restaurant, accounting for **7,031 orders**, or approximately **55%** of all daily transactions.
- **Peak Days:** The weekend is the primary driver of weekly sales. **Saturday (1,979 orders)** and **Sunday (1,957 orders)** together account for **3,936 orders**, representing **30.8%** of all sales for the week.

Time Period	Peak	Total Orders
Peak Hour	7 PM (19:00)	1,527
Busiest Day	Saturday	1,979
Second Busiest Day	Sunday	1,957

5. Explanation of Analysis Procedure

In this analysis, a combination of basic and advanced methods have been used, each of which will contribute to addressing the challenges faced by **Pizza Planet.** This analysis will try to investigate customer behavior, platform performance, and temporal sales patterns. This structured process ensures that the findings are both reliable and directly relevant to the core business problems.

5.1 Data Preprocessing and Transformation

Purpose:

The primary purpose of data preprocessing was to clean, structure, and enrich the raw transactional data from the Pet Pooja POS system and Excel logs. This foundational step was essential to ensure the accuracy, consistency, and reliability of all subsequent analyses and to create new data features required to answer the project's core business questions.

Methodology:

The raw data was first loaded into Google Sheets for manipulation. Key steps included:

- **Feature Engineering:** New columns (HourOfDay, DayOfWeek, Month) were created by parsing the Date column to enable time-based analysis. A CustomerId was generated from the Phone column.

- **Categorical Unification:** A single, clean Platform column was created by consolidating data from the Order Type and Area columns to standardize sales channels.

- **Data Cleansing:** Redundant columns were removed, and outlier rows with ambiguous labels (e.g., "Due paid" in Payment Type) were filtered out to ensure data integrity.

5.2 Busiest Times Analysis

Purpose:

This analysis was conducted to identify the peak operational hours and days for Pizza Planet. The goal was to provide data-driven insights that could inform decisions on staff scheduling, inventory management, and targeted marketing efforts during high-traffic periods.

Methodology:

Using the preprocessed data, the total number of orders was aggregated by the HourOfDay and DayOfWeek columns. This was achieved by creating Pivot Tables in Google Sheets that counted the Invoice No. for each distinct hour and day. The resulting data was then visualized using a line chart for the hourly trend and a bar chart for the daily trend to clearly illustrate the peaks.

5.3 Customer Loyalty Analysis

Purpose:

This analysis aimed to quantify customer retention and prove the business problem of a "leaky bucket" of customers. The objective was to understand the proportion of new versus repeat customers and to highlight the missed opportunity from not systematically collecting customer data.

Methodology:

First, the data was filtered to include only orders with a valid CustomerId. The COUNTIF function was used on the CustomerId column to count the number of orders placed by each unique customer. Based on this count, customers were segmented into groups (e.g., 1 order, 2 orders, etc.). A bar chart was then created to visualize the distribution, showing the stark difference between one-time buyers and repeat patrons.

5.4 Platform Performance Analysis

Purpose:

The goal of this analysis was to evaluate the performance of different sales channels (Dine In, Zomato, Swiggy, Parcel). This was done to determine which platforms generate the most revenue and order volume, thereby helping the business focus its marketing and operational efforts effectively.

Methodology:

The dataset was grouped by the cleaned Platform column. For each platform, the Net Sales (₹) were summed and the total Invoice No. was counted using a Pivot Table. The Average Order Value (AOV) for each platform was then calculated by dividing the total net sales by the number of orders. The results were visualized using a bar chart to compare the net sales across platforms.

5.5 Payment Type Analysis

Purpose:

This analysis was performed to understand the payment preferences of Pizza Planet's customers. Identifying the dominant payment method (Cash vs. Online) provides insights into customer behavior and helps in managing daily cash flow and operational procedures, such as cash handling for deliveries.

Methodology:

The data was grouped by the Payment Type column, and the total number of orders for 'Cash' and 'Online' was aggregated using a Pivot Table. The analysis was further broken down by month to check for consistency in the trend. The findings were visualized using a clustered bar chart to compare the two payment methods side-by-side for each month.

6. Results and Finding

The analysis of Pizza Planet's transactional data has yielded several key findings that provide a clear, data-driven picture of the business's operational strengths and strategic opportunities. The following section details these insights, supported by visual representations of the data, to guide future decision-making in marketing, operations, and customer relationship management.

6.1 Evening and Weekends are Peak Business Periods

No. Of Orders vs. HourOfDay
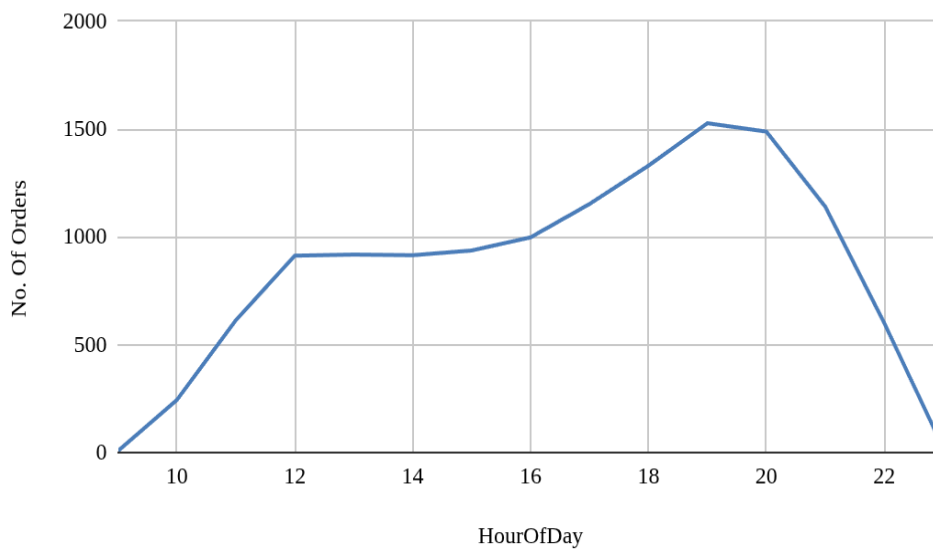
The temporal analysis reveals a highly concentrated pattern of business activity. Operations ramp up significantly in the evening, with the five-hour window from **5 PM to 9 PM** accounting for **55%** of all daily orders. The absolute peak is at **7 PM**. Similarly, the weekend drives a substantial portion of weekly revenue, with **Saturday** and **Sunday** together accounting for **30.8%** of all orders.

Implication: This predictable rush provides a clear directive for optimizing staff schedules to handle the load, ensuring better inventory planning for weekends, and timing promotional offers to maximize visibility during these high-traffic periods.

6.2 A Significant Customer Retention Gap Exists

No. Of Customers vs. No. Of Orders
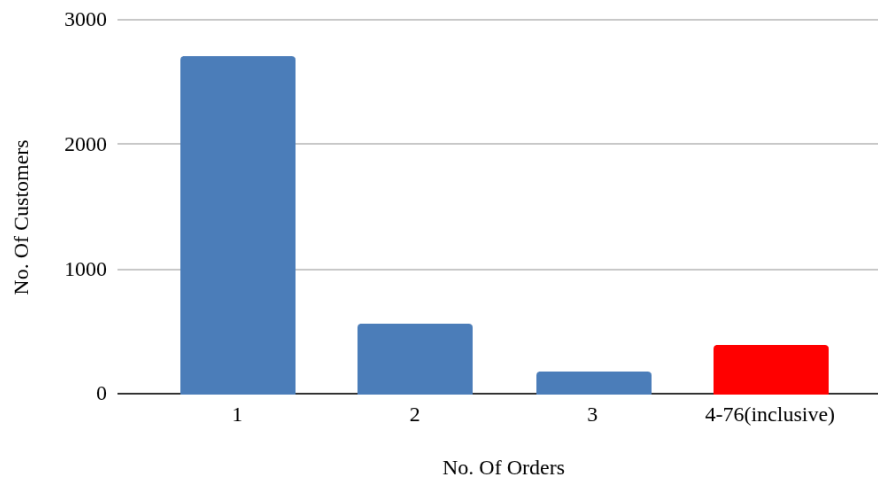
The customer analysis highlights a major challenge and opportunity in customer loyalty. A significant data gap was identified, as customer contact information was captured for only **45.43%** of the **12,789** total transactions. Within the cohort of trackable customers, the data shows a classic "leaky bucket" problem: **73.8%** of unique customers (**2,711** out of **3,670**) have only ordered once.

Implication: Pizza Planet is missing a crucial opportunity to build a loyal customer base. The lack of a systematic data collection process prevents targeted marketing and the development of a loyalty program, which is essential for converting new customers into a stable source of recurring revenue.

## 6.3 Dine-In is the Dominant Sales Channel

Net Sales (₹) vs. Platform
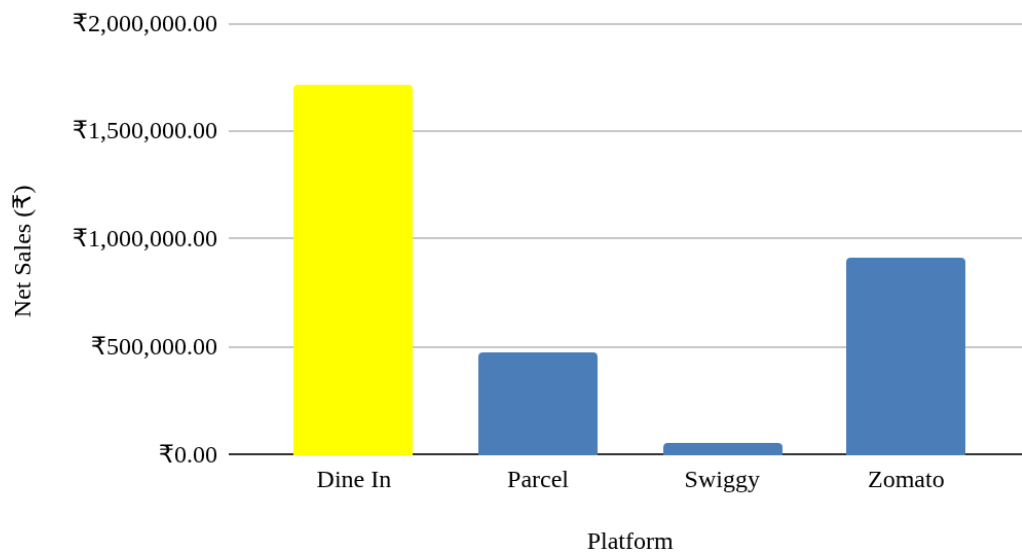
The platform analysis shows that the business's primary strength lies in its physical location. **Dine In** is the most valuable channel, contributing **54.3%** of total net sales with **₹1,716,743** from **6,900** orders. **Zomato** is a strong secondary platform, generating **28.9%** of sales. In contrast, **Swiggy** is significantly underperforming, accounting for only **1.7%** of sales.

Implication: While the strong dine-in performance is positive, the heavy reliance on a single channel is a risk. There is a clear opportunity to grow the business by optimizing the online delivery strategy, particularly by investigating and improving performance on the Swiggy platform.

6.4 Cash is the Overwhelmingly Preferred Payment Method

Cash and Online
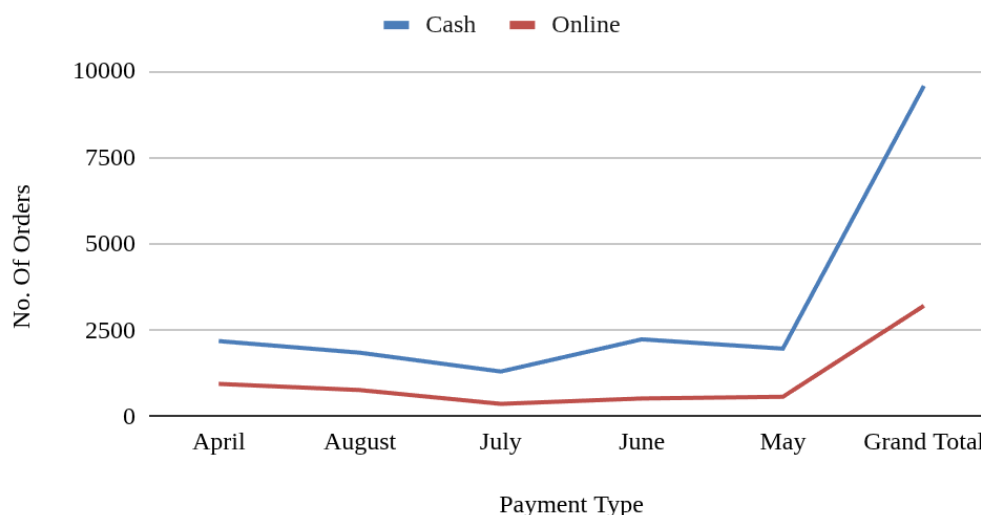
The analysis of payment types reveals a strong customer preference for physical currency. Approximately **75%** of all transactions (**9,575** out of **12,789** orders) were paid in **cash**. This trend was consistent across every month analyzed.

Implication: The dominance of cash, especially with a high volume of deliveries, has operational consequences. It requires drivers to carry sufficient change and introduces complexities in daily cash handling and reconciliation. It also suggests that many customers select "Pay on Delivery," a behavior that could be influenced by offering small incentives for prepaid online orders to improve cash flow and operational efficiency.

<u>END OF REPORT</u>