Enhancing Xerox shop Operations through Data-Driven Strategies

BDM capstone project End Term Submission

Submitted by

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1. Executive Summary: -

This end-term report presents a comprehensive Business Data Management (BDM) analysis conducted at a Xerox shop and cybercafé located at Lohagarh Fort, Bharatpur. The shop offers services such as printing, typing, form filling, bill payments, lamination, and mini-bank services in partnership with the Bank of Baroda. Despite catering to a variety of customer needs, the business faced challenges related to financial mismanagement, inconsistent customer flow, competition, unmet banking targets, and long wait times during peak hours. This project aimed to address these issues through data-driven strategies to optimize the shop's operations and improve overall customer satisfaction.

The analysis and methodology section covers the data collection process, where handwritten records of daily transactions, customer demographics, and service usage patterns were digitized and cleaned using Microsoft Excel. Data from January to June 2024 was examined, covering 152 working days to gain insights into different aspects of the business. The analysis involved identifying cash flow trends, tracking the account services offered, segmenting customers based on their use of Xerox services, and evaluating customer wait times during peak hours. Advanced Excel functions such as pivot tables and data visualization techniques were utilized to analyze the data effectively and draw meaningful insights.

The results and findings section outlines key observations, such as irregular cash flow patterns during peak and non-peak days, areas with higher demand for account services, and differences in service usage among students, general customers, and office workers. The analysis of customer wait times revealed significant congestion during peak hours, indicating a need for better resource allocation. Additionally, geographical data analysis identified specific areas for potential customer outreach to increase the number of account openings and enhance the shop's market presence.

In the recommendations section, actionable suggestions are provided to address the identified challenges. These include maintaining a cash reserve of ₹60,000 during peak days for smoother cash flow management, targeting specific neighborhoods with marketing campaigns to boost account openings, extending discount offers for bulk Xerox orders to attract more customers, and adjusting staffing schedules to reduce customer wait times. The report emphasizes leveraging partnerships with educational

institutions to secure steady bulk orders and using data analytics tools continuously to monitor trends and optimize business strategies.

Overall, the report provides a structured approach to addressing the Xerox shop's challenges, offering solutions that aim to improve operational efficiency and customer satisfaction while driving revenue growth.

2. Detailed Explanation of Analysis Process/Method

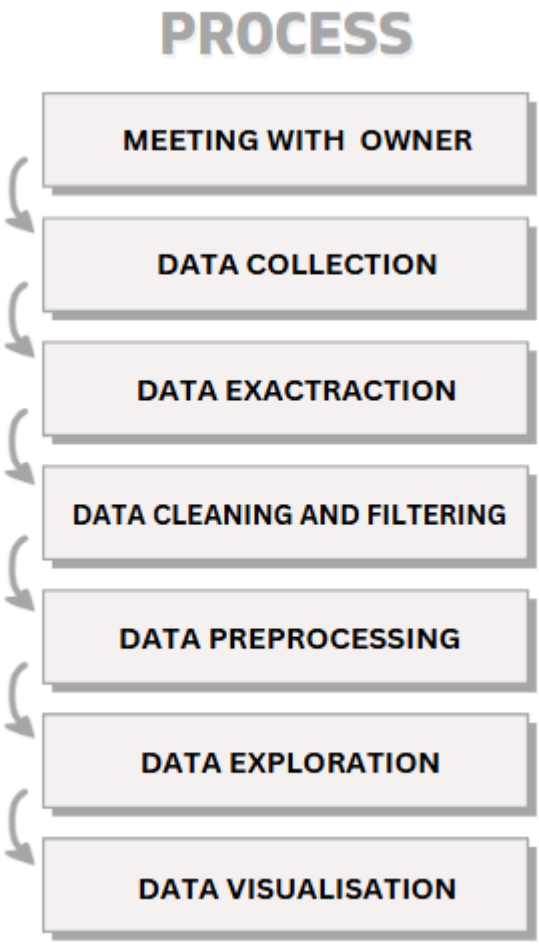

Figure 2.1

- Meeting with the owner :
  - To get the knowledge about the business and its problems.
  - Discussions upon the services they provide and their sales and profit distribution.
  - Got to know about less use of services like Xerox Printouts , color printout,

Lamination, PVC card making etc.

- Got to know about fluctuations and inconsistencies in business.
- Financial Mismanagement was one of the problems.
- The business operates in a declining market with rising competition, making it challenging to sustain its customer base and market share.
- Problems in achieving bank set targets for account opening.

❖ Data Collection and extraction:

- I collected handwritten data for account opening data and daily debit and credit dataset.
- I collected daily distribution of Xerox printouts in between students office employees and other common people.
- I then transformed that handwritten data into excel for the analysis purposes.

Link to the data : Survey BDM - Google Sheets

❖ Data Cleaning and preprocessing:

- The raw data underwent a thorough cleaning process to remove irrelevant or unuseful information. This step helped focus on the critical data needed for analysis.
- Data preprocessing plays a vital role in preparing data for analysis. It's about making sure the data is clean and consistent before diving into any insights. This includes handling missing values, either by filling in gaps or removing incomplete records to avoid errors in analysis. It also involves standardizing formats and units across the dataset for consistency. Removing irrelevant or incorrect data helps to avoid skewing the results. Finally, transforming the data into the right format ensures it's ready for analysis. Overall, preprocessing sets the stage for more accurate and meaningful insights.

Data Exploration and Visualization:

Exploratory data analysis (EDA) involved delving into the datasets to uncover trends, relationships, and anomalies. Several types of visualizations were employed to better understand the data and communicate insights:

1. **Line Charts**:
    - **Purpose**: Track changes in daily **credit and debit transactions** over time.
    - **Outcome**: This helped in visualizing the differences between peak and normal days by plotting cumulative credit and debit data over the analysis period (January to June).
2. **Bar Charts**:
    - **Purpose**: To analyse the geographical address of customers who opened their accounts previously from the shop.
    - **Outcome**: The bar charts provided a clear breakdown of which address were contributing most to the account opening.
3. **Pie Charts**:
    - **Purpose**: Again to Visualize the geographical address of customers.
    - **Outcome:** The pie charts offered a clear representation of the share of account openings across different areas, helping to prioritize regions with higher potential for targeted campaigns.
4. **Pivot Tables**:
    - **Purpose**: Summarize data, such as **total orders**, **average orders**, and **bulk order ratios** for each customer type.
    - **Outcome**: This allowed for quick analysis of the bulk order data, making it easier to derive meaningful statistics and business insights.
5. **Column Charts**:
    - **Purpose:** To visualize the distribution of bulk orders among different customer segments.
    - **Outcome**: These charts helped identify which customer groups—students, general public, and office employees—were contributing the most to bulk orders, enabling targeted promotional strategies to increase engagement and sales in underperforming segments.

Data visualization is essential for understanding trends, patterns, and insights in the data. It helps to represent complex datasets in a simple and intuitive way, making it easier to identify relationships and outliers. Through various chart types like line charts, bar charts, pie charts, and pivot tables, visualization brings clarity to the underlying data by illustrating differences, distributions, and trends. It transforms raw data into visual stories, enabling quicker and more effective decision-making. Ultimately, data visualization is a

powerful tool for communicating insights in a clear and actionable manner.

- **Daily debit and credit analysis:**
  - Cleaned the non-useful values in daily debit and credit dataset.
  - Now motive is to find how to differentiate between sufficient amount of money in the bank at normal days and on peak days
  - Do determine peak days and Normal days I added difference column which shows difference between credit and debit in a day and a commulative credit column (debit + credit) to get an idea of max money needed in the day because when its debiting also , owner needs pre-money to give it to customer so that's why this coloumn is added.
  - Discussed and decided Commulative credit greater then 30,000 in a day considered as peak day.
  - Found 37 Peak days out of 152 working days between Jan 24 to June 24.
  - On the basis of average credit and debit on peak days and normal, decided the best result for this problem discussed in the results section.

- **Geographical Analysis for bank account opening:**
  - Analyzed account-opening data by regions to identify areas with potential growth or those needing more targeted marketing.
  - Identified regions where account openings were below target and strategized efforts to increase awareness and engagement.
  - Recommended marketing campaigns focusing on regions with untapped potential to help the business achieve its bank targets.
  - **Why conduct a geographical analysis for account openings?**

    Understanding regional variations helped focus resources on areas with the most potential, thereby improving the efficiency of marketing efforts and supporting the business in meeting its bank-related targets.

❖ **Bulk order analysis :**

- Examined the patterns of bulk orders from businesses, schools, and institutions, including seasonality in order demand.
- Identified months and periods when bulk orders surged, helping the business plan inventory and staffing accordingly.
- Recommended targeted discounts or promotions to attract more bulk orders during off-peak times.
- **How did this analysis benefit the business?**

  By identifying when bulk orders typically occur, the business could better allocate resources and improve sales, especially during slower periods, which ultimately contributed to more stable revenue.
- **Why focus on bulk orders in particular?**

  Bulk orders are significant revenue generators, and understanding their patterns helped in stabilizing income and reducing reliance on smaller, unpredictable transactions.

3. Results and Findings: -

a) Debit Vs Credit:

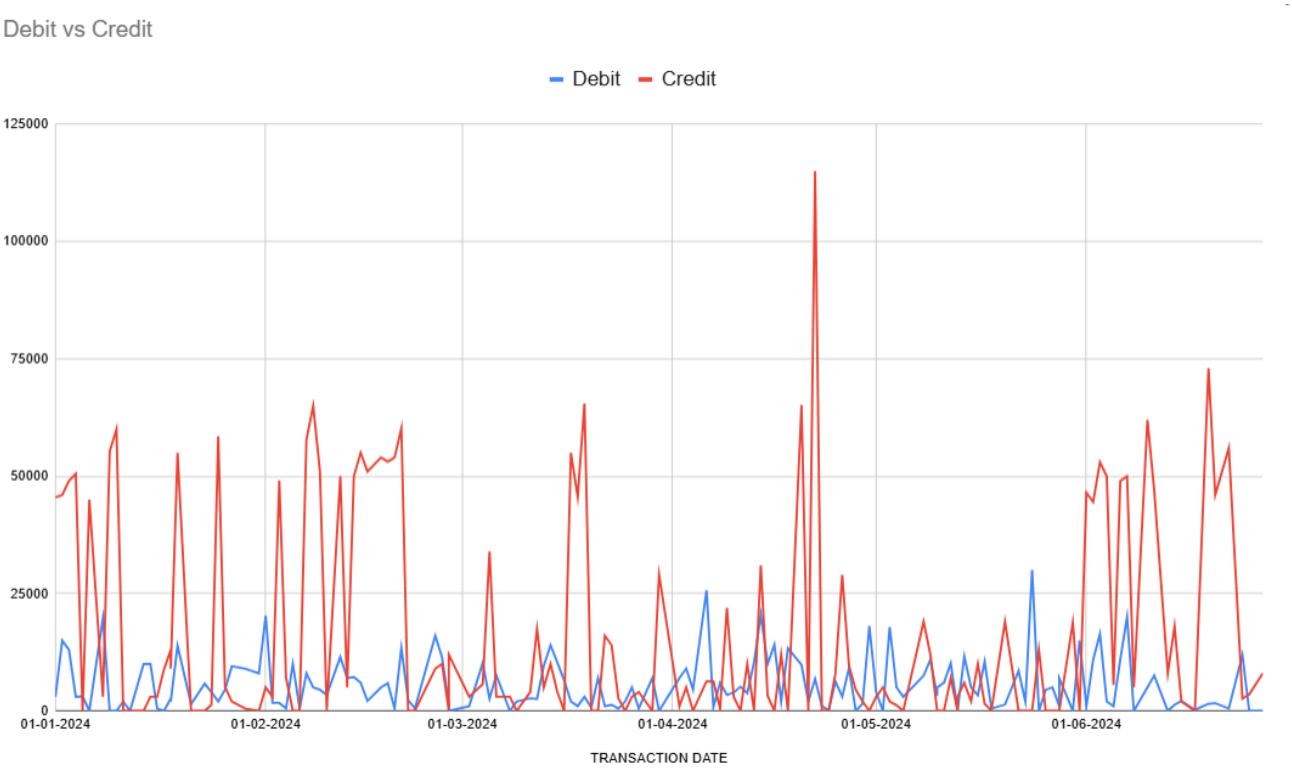

Figure 3.2

- Observation: It is evident from the graph that the credit amounts consistently exceed the debit amounts. The high volume of transactions is largely due to the use of the Aadhaar-enabled payment system, where money transfers (represented as credits) are more frequent than money withdrawals (represented as debits).

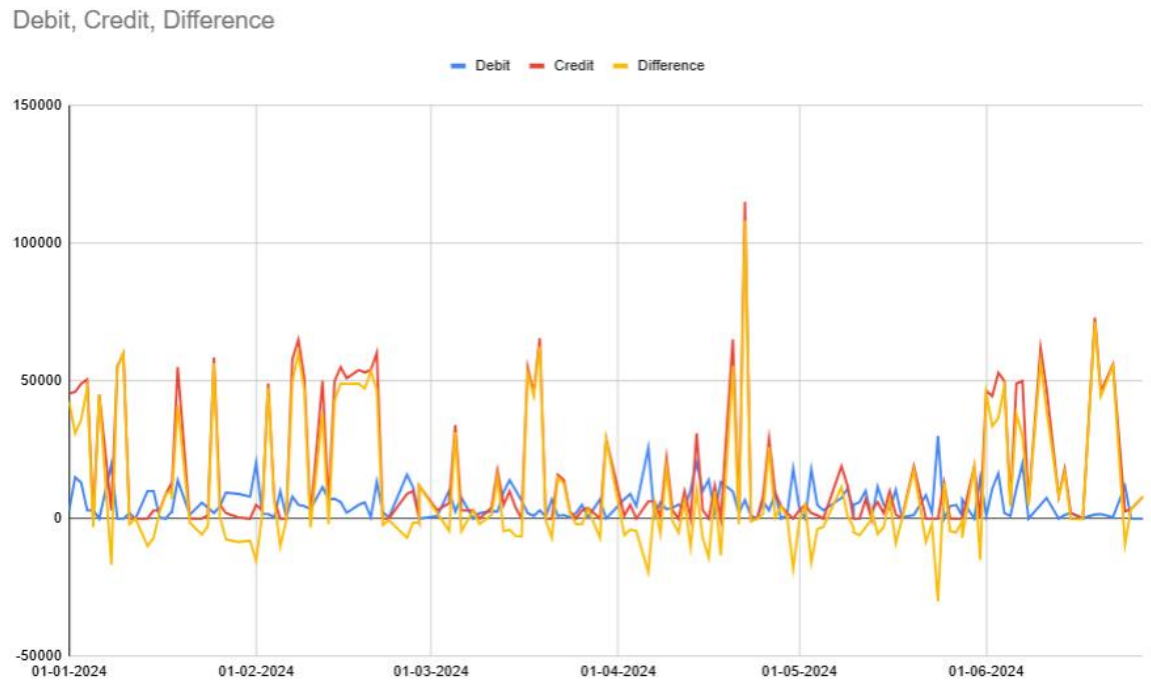

Figure 3.3

- Observation: The yellow line in the graph represents the difference between credit and debit amounts. It fluctuates primarily with the credit amounts since the debit amounts are consistently lower, having minimal impact. The points where the yellow line dips into the negative reflect days when debit exceeded credit. However, this is rare, as the credit amounts are generally higher, driving the overall trend of the yellow line.

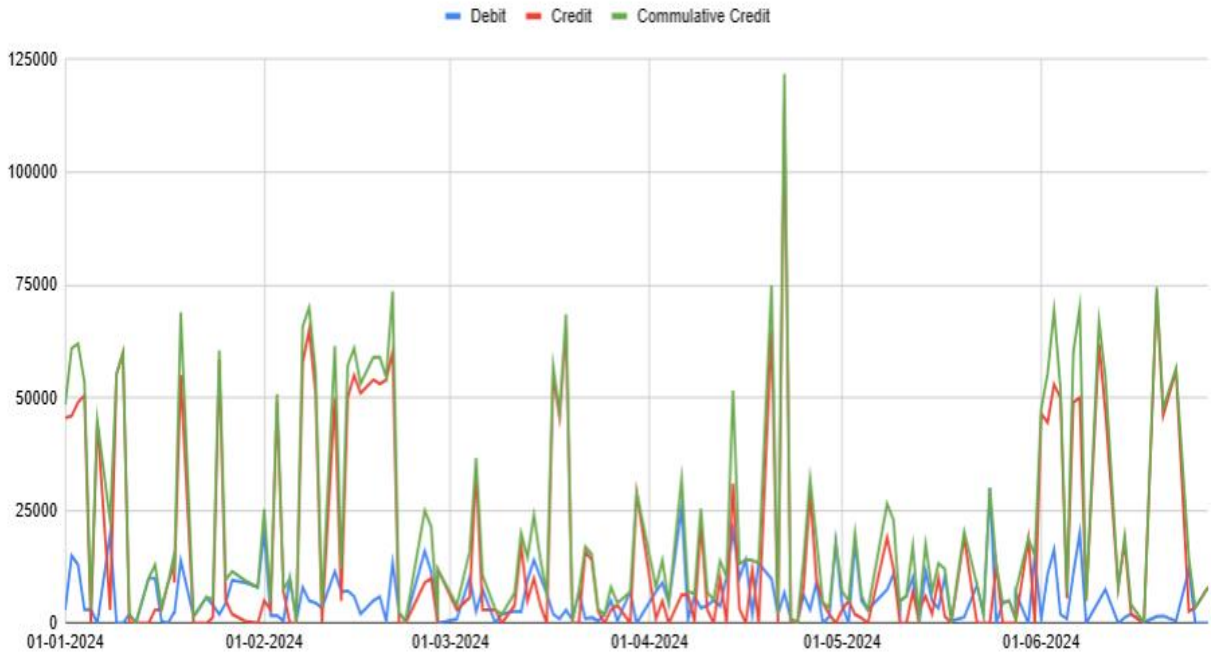

Figure 4.3

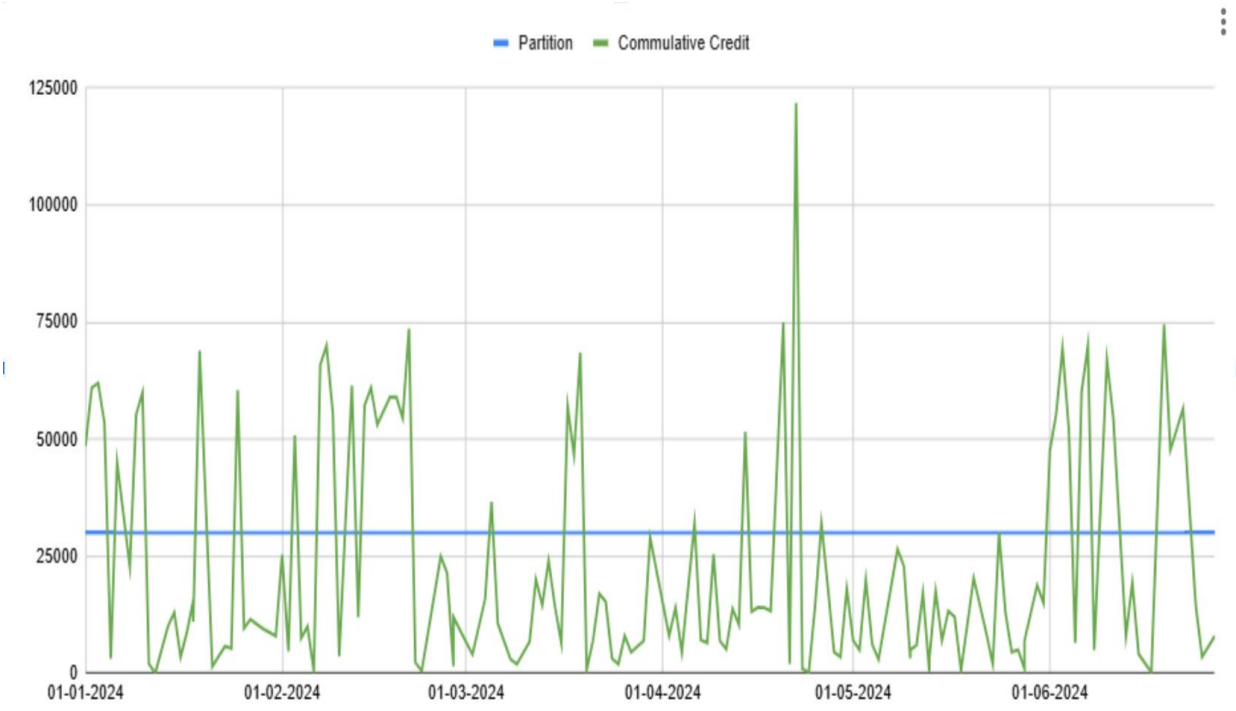

Figure 3.5

- Observation:
  - The graph clearly illustrates the monthly distribution of peak days, highlighting periods where customer activity and cash inflows are notably higher. It is evident that certain months, like January, March, and May, experience a higher frequency of continuous peak days, indicating periods of increased business activity.
  - During these peak periods, a higher amount of cumulative credit is recorded, requiring careful financial management to ensure smooth operations.

Pivot table:

Metric	Peak Days	Normal Days
Total Debit	203400	654000
Total Credit	2022320	602440
Commulative Credit	60155	10926
Average Debit	5497	5687
Average Credit	54657	5239
Number of Days	37	115

Table 3.1

- After analyzing the data, a pivot table was created to provide deeper insights into the volume of transactions, categorizing them into peak and normal days.
- The table breaks down key metrics such as Total Debit, Total Credit, Cumulative Credit, and daily averages.
- The analysis highlights that, on average, the business owner needs to maintain a balance of approximately ₹60,000 (average cumulative credit amount) during peak days. This buffer ensures the business can accommodate the increased cash inflows, minimizing the need for frequent bank visits and maintaining operational efficiency.

b) Geographical analysis :

To improve campaign targeting and enhance customer reach, I combined addresses where colonies had similar names or were situated close to each other. This grouping helps create a clearer and more accurate visualization of customer distribution, enabling better decision-making for future campaigns.

Bar Graph:

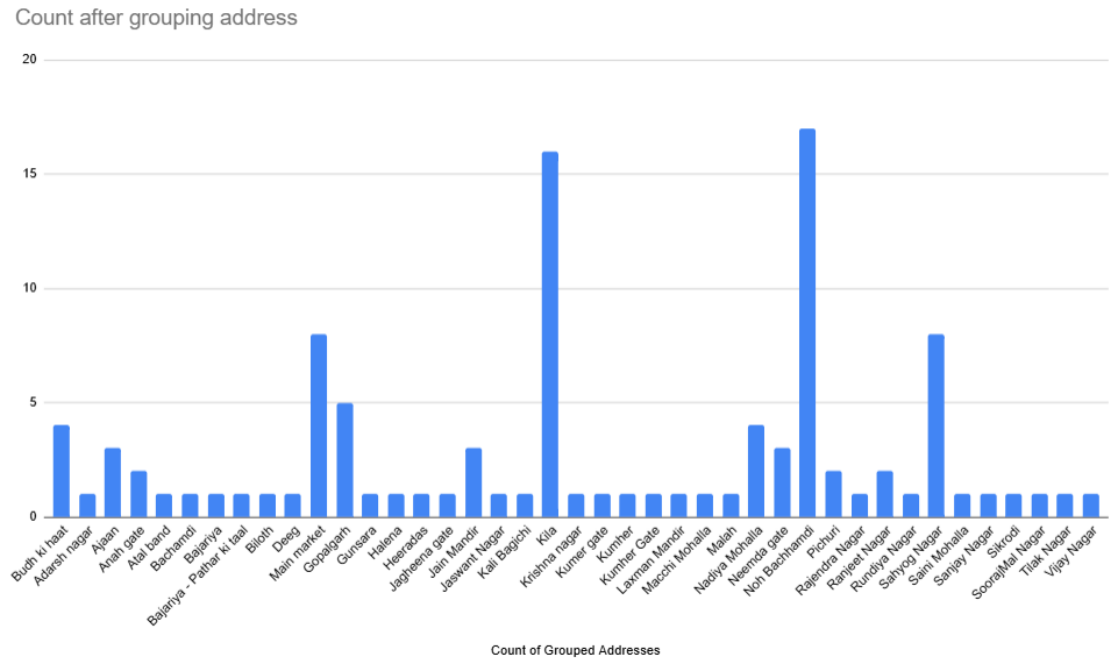

Figure 3.6

Insights: The bar graph shows how many customers come from each of these grouped areas. It's clear that some places have only one or two customers, which might not be the best spots to target with marketing campaigns. This could be because those areas are farther from the shop or have other similar services nearby.

Conclusion: By focusing on areas with more customers, we can make our marketing efforts more effective and attract more business. Places with more customers, as shown in the graph, are likely to respond better to promotional activities.

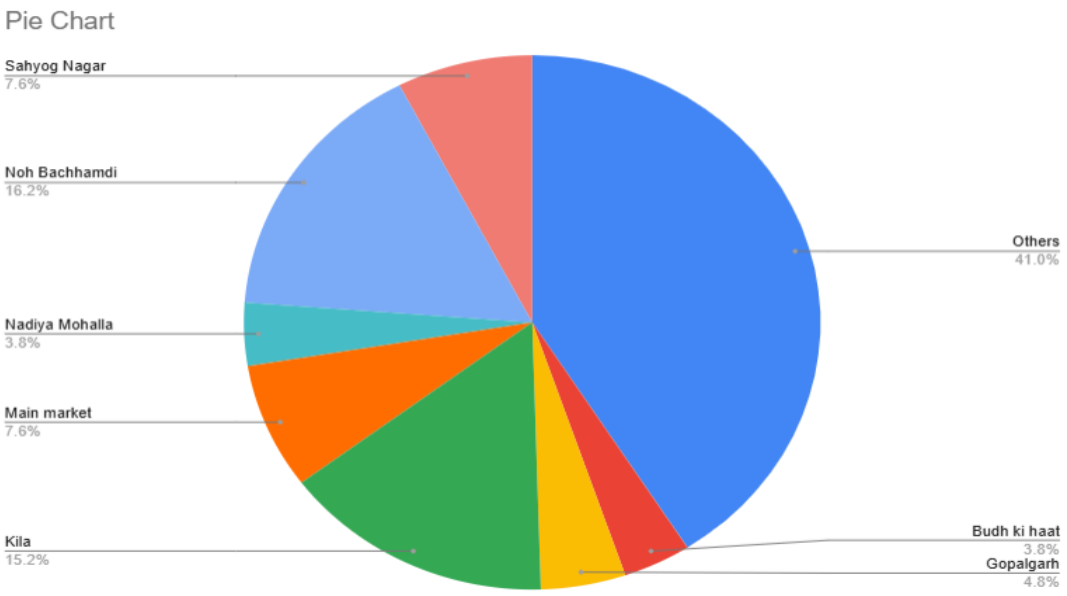

Figure 3.7

After analyzing the top contributing areas beyond Kila and Noh Bacchamdi, a pie chart was created to highlight other potential places such as Sahyog Nagar, Nadiya Mohalla, Main Market, Buddh Ki Haat, and Gopalgarh.

Top Performers: The highest number of account openings came from Kila, which is consistent with the shop's location. Additionally, a two-day promotional camp in Noh Bacchamdi led to a 16.2% increase in account openings, showcasing the effectiveness of targeted marketing efforts.

Promotional Impact: The success of activities like the camp in Noh Bacchamdi underlines the positive impact of targeted marketing on customer engagement and account openings. This emphasizes the importance of strategic efforts for business growth.

c) Bulk order analysis:

Column Chart:

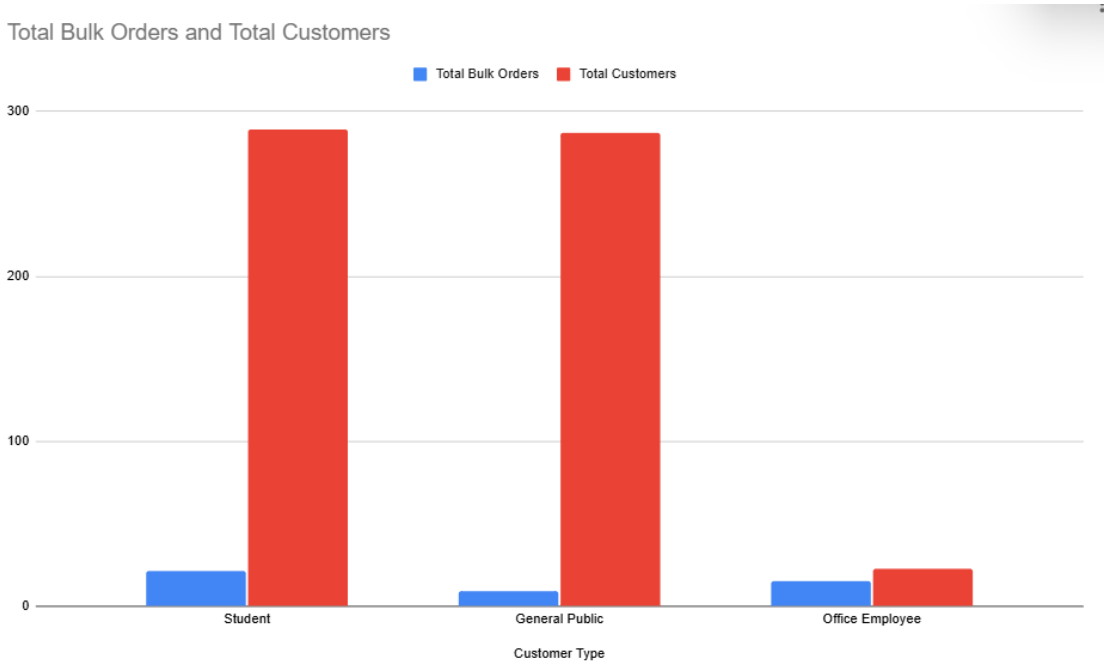

Figure 3.8

Pivot Table:

Customer Type	Total Bulk Orders	Total Customer	Average Bulk Order Ratio	Total Copies
Student	21	289	0.07266435986	3220
General Public	9	287	0.03135888502	2583
Office Employee	15	23	0.652173913	5605

Table 3.2

As it is clearly seen that bulk orders are mostly done by office employees according to dataset , that's because of direct contracts of the offices for xerox services , and shop provide them bulk rates of xerox so same we can do for students to attract more bulk orders as it is very less seeing current situation.

Office employees were the highest users of bulk orders and copies, totaling 5,605 copies in a month, while students placed more bulk orders but with fewer copies overall.

I recommended that the owner put up a poster outside the shop offering a 25% discount for students who make more than 30 copies in a single order. The poster has been up for a month, and although there is no formal tracking of the improvements, the owner reports that bulk orders by students have increased by 100%. Now, there is growing demand from the general public for a similar discount when they bring in larger orders, which seems fair. We will address future plans in the recommendation section.

The current bulk order threshold of greater than 30 copies was found to be effective, though adjusting this criterion could improve service efficiency and better meet customer needs.

4. Recommendations: -

- Keep **Enough Cash on Peak Days:**

It's a good idea to have about ₹60,000 on hand during busy days. This is based on the average cash needed on peak days. Watching trends each month will help predict when more cash is needed.

- Promote **Cashless Payments:**

Encourage customers to pay using UPI to reduce cash handling. This makes transactions faster and helps keep better records. Put up signs and train staff to promote UPI payments.

- Targeted **Promotions in High-Potential Areas:**

Focus marketing efforts on areas like Sahyog Nagar, Nadiya Mohalla, and the Main Market, where there's more business potential. Collect phone numbers from these areas and send automatic messages to inform people about deals, account opening offers, or other services. This could bring in more customers and boost sales.

- **Offer Discounts to All Customers:**

Since people are asking for the same discounts given to students, consider extending similar discounts to everyone. Use a tiered discount system:

20% off for 30-50 copies

25% off for 51-100 copies

30% off for over 100 copies

This way, you encourage customers to order more copies at a time.

- **Change Bulk Order Limits for Different Groups:**

Lower the bulk order requirement for students to 20 copies to encourage them to order more often. For office workers, you can keep the limit at 30 or raise it slightly, as they usually order larger quantities anyway.

- **Partner with Schools and Colleges:**

Team up with educational institutions to offer special rates. Schools and colleges have large copying needs, which could bring in steady business. Hold events or give special offers at these places to secure long-term contracts.

- **Use Data to Keep Improving:**

Regularly analyze sales data and customer behavior to understand what's working and what's not. Look for trends that can help you decide where to focus marketing or adjust prices. This will keep the shop flexible and ready to take advantage of new opportunities.

- **Update Discounts and Promotions Regularly:**

Keep an eye on what discounts work best and change them if needed. Customer needs or competition might require you to adjust your offers to stay appealing.

- **Use Technology for Marketing:**

Automate marketing by sending messages to customers about new deals or services. Set up online order tracking for easier customer service.