BUSINESS DATA MANAGEMENT - CAPSTONE PROJECT

Title : Optimizing Business Operations and Growth Strategies for Balaji Computer Shop

Mid Term report for the BDM Capstone Project

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1. Executive Summary:

The project focuses on Balaji Computer & Emitra Services, a B2C business located at Iscon Plaza, Sadar Bazar, Sirohi, Rajasthan. The shop offers a wide range of services, including printouts, Xerox, online application form filling, Aadhar card printing, PVC card printing, PAN card creation, driving license assistance, and other essential documentation services.

Despite its diverse offerings, the business faces several operational challenges that impede its growth and profitability. This project aimed to identify these challenges, analyze their root causes, and propose actionable solutions to enhance efficiency and scalability. The primary challenges identified during the analysis include the shop's heavy reliance on manual processes, inefficient operational workflows, intense competition, recurring technical issues, staffing constraints, and limited scalability.

This report includes metadata, statistics, graphs, visual illustrations , photographs , google meet video, and an Authorization Certificate from the organisation. Detailed analysis involves cleaning and sorting the data, use of python libraries to gain insights and visualise various parts of it. Concepts such as descriptive analytics, trend analysis, and root cause analysis were applied to derive actionable insights from the data.

The analysis revealed several critical insights, including peak service hours, the most profitable services, and recurring technical disruptions.

2. Proof of Originality of the Data :

The primary data of three months (November to January) used in this report was directly collected from Balaji Computer & Emitra Services . A virtual meet was organised with Mr Praveen Gehlot, the Owner of this shop, to discuss the details about the company and enquire about the various challenges being currently faced by the business. Some photographs of the shop were also clicked. The relevant files are present in the link below:

Proof of Originality

3. Metadata

The data for this project was recorded from November 2024 to January 2024 and was provided as a zip file containing multiple csv files, one containing monthly data consisting of the Date ,Services availed, MRP, Opening Time, Quantity, Day, Week.

Month_data.csv has the following information:

Attributes	**Data type**	**Description**
Date	Date	Date of the service in the DD-MM-YYYY format
Day	String	Date wise day of the service
Opening_Time	Time	Opening time of the shop in HH-MM-SS
Types_of_services	String	Types of services accordingly date
MRP(Rupees)	Numeric	Amount charged by the shop owner for the service in Rupees(Rs)
Quantity	Numeric	Quantity of the service in the whole day.
Total_sale_amount	Numeric	Total sale amount which is multiple of quantity and fixed MRP accordingly services in rupees.
Week	Numeric	This is the Week based on the date in YYYY-WW format.

Total_sale.csv has the following information:

Attributes	**Data Type**	**Description**
Types_of_services	String	Types of services accordingly date
MRP(Rupees)	Numeric	Amount charged by the shop owner for the service in Rupees(Rs)
Quantity	Numeric	Quantity of the service in the whole day.
Total_sale_amount	Numeric	Total sale amount which is multiple of quantity and fixed MRP accordingly services in rupees.

monthly_expense.csv has the following information:

Attributes	**Data type**	**Description**
Types_of_expense	String	Types of expense per month.
Amount	Numeric	Amount accordingly types of expense in rupees

4. Descriptive Statistics

4.1 Description of Total Sales

Metric	MRP (Rupees)	Quantity	Total Sale Amount (INR)
Count	408	408	415
Mean	44.44	10.43	235.29
Standard Dev.	33.95	22.61	312.04
Min	2	1	0
25th Percentile	10	3	50
Median (50%)	50	4	120
75th Percentile	80	11	255
Max	80	300	2560

From this description, we can observe that a standard deviation of MRP_rupees is high implying high variability. Simply Quantity is the count of total service provided in three months. MRP_ruppes is the fixed price according to the type of services. The highest amount of service is 80 rupees which may be color print, Online form or Driving licence and the lowest is 2 rupees which is Xerox and Xerox is also high quantity service but small amount. The Total_sale_amount mean is 235.29 and std deviation is 312.04 which is much higher. Minimum is 0 because that day shop is closed and Max is 2560 which is the highest sales in a day.

4.2 Description of Monthly Statistics

Month	Total Revenue	Mean Revenue	Total Transactions	Std. Deviation	Max Revenue	Min Revenue
Nov-24	37616	293.88	129	389.58	2560	0
Dec-24	28480	197.78	144	250.22	1440	0
Jan-25	31610	225.79	140	284.95	1600	0

Based on this, November 2024 has the highest total income with December 2025 being the least. December has the lowest average charges compared with other two main data months Nov and Jan less indicating revenue services. November month is Highest revenue because of the many Online college forms, entrance exam forms etc filling start from November month. So, the November month is the peak revenue mont

4.3 Description of the Types of services

Service Type	Total Revenue	Mean Revenue	Total Transactions
Online Form	51200	701.37	73
Color Print	18100	312.07	58
Driving Licence	7440	177.14	42
Pan Card	6100	135.56	45
Print	5120	74.2	69
Xerox	4862	65.7	74
Lamination	3060	78.46	39

On analysing the services, it was found that a total of 7 unique services were availed with Online form and Color print being the topmost ones.

This data shows that Online Form generates substantial income across all the three months. Online forms are in season demand. Some services like Color Print, Driving Licence, Pan card, Xerox, Print and Lamination are other factors of income.

4.4 Description of Monthly Services

Service Type	Nov-24	Dec-24	Jan-25
Online Form	22240	12880	17280
Color Print	6800	5920	5440
Driving Licence	2800	2560	2320
Pan Card	1850	2450	1850
Print	1660	1700	2070
Xerox	1406	1970	1550
Lamination	860	1000	1100

Online Form is the main resource of the revenue in the entire three months. November 2024 generates the highest income from Online form and Color Print. This data shows the types of services via months. Online form in November month is maximum and the Pan card, Xerox and Driving Licence is peak in December month. Print and Lamination is the max in the January month. Basically this data showed the analytics the type of service according to the months and the value of services.

4.5 Description of Total Volume

Metric	Value
Total Revenue	97706
Mean Revenue per Transaction	232.0807601
Total Transactions	421
Total Quantity Sold	4255
Mean Quantity Sold per Transaction	22.9626322

This data shows that the total revenue of three months is 97706 rupees, avg revenue per transaction is 232.08 rupees. Total transaction is 421 and total quantity sold is 4255.

5. Detailed Explanation of the Analysis Process/Method

5.1 **Data loading and Exploration** : Firstly I have data in handwritten format. So I used Excel for making spreadsheets and cleaning of dataset. All the datasets were loaded in an Excel format. Few some important columns from each dataset like Types of services, MRP, Total sales, Quantity were explored with basic statistics function like SUM, Average, Std Deviation etc. and Pivot table to understand the distribution of services availed, revenue generated by each service per month , relation between Total service amount and months to gain significant insights.

5.2 **Descriptive Statistics** : An overall revenue of the three months was presented by calculating important features like mean, std. deviation, min, max and other descriptive statistics. Additionally, a month-wise breakdown of total revenue for each service was generated, providing valuable insights into the fluctuations in service performance over the given time period.

5.3 **Monthly Trend Analysis** : We created Bar graphs to analyse the income generated by services over the time period of three months. Additionally pie charts are also created for understanding the revenue rate according to the types of services.

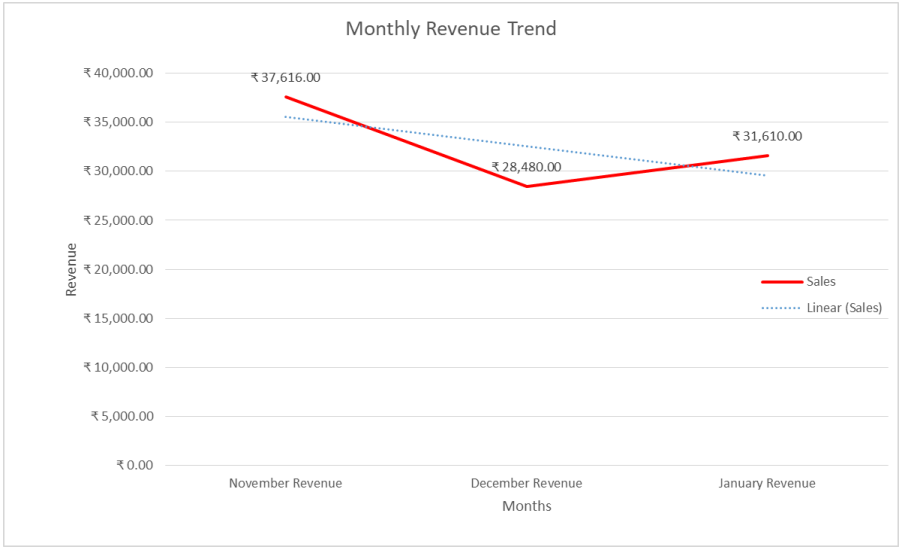
5.4 **SWOT Analysis** : I used the SWOT analysis method to find out the exact problem and how to resolve them. I Identify the internal strengths, for instance the experience of more than 10 years, existing customer base, location in a busy area, and the ability to offer a variety of services. I found many weaknesses such as inconsistent service hours, staffing issues, limited advertising from the discussion of the shop owner and analysing of the data and also found the strengths of this buisness. Then I found the opportunities of this shop.

5.5 **Pivot Table Analysis** : I create pivot tables which have a measured column is Date , Type of service, MRP, Quantity and the total amount. Then I create many types of graphs between many columns and find the exact relationship between two columns. I used Bar charts, Pie charts, Scatter diagrams etc. to generate valuable insights from data.

5.6 **Using Python for Analysis**: I also use the python language for data analysis just like count, min , max 25%, 75% , median and standard deviation etc. I create many different types of graphs using python and find the trends and relationship between the services.

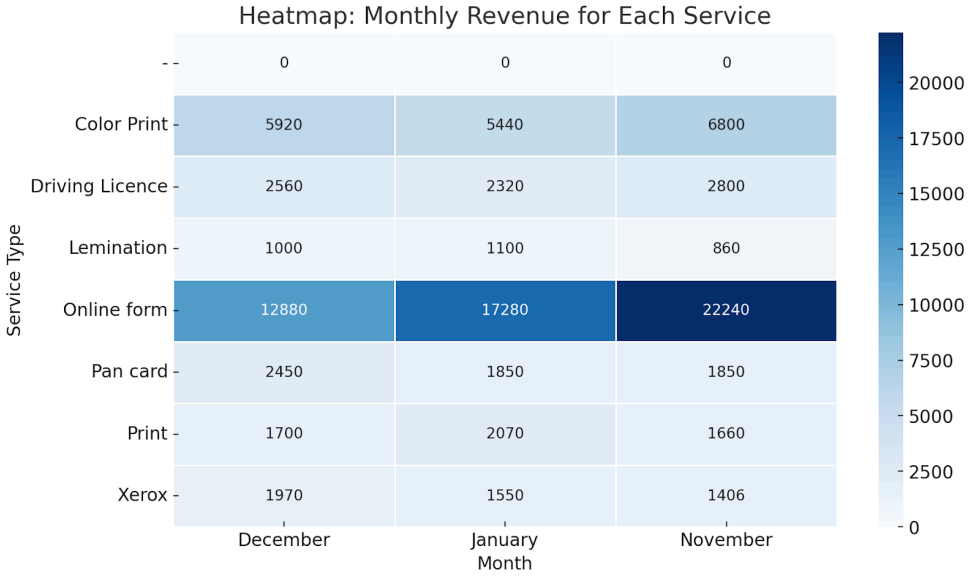
6. Results and Findings

6.1 **Trends in monthly revenue**



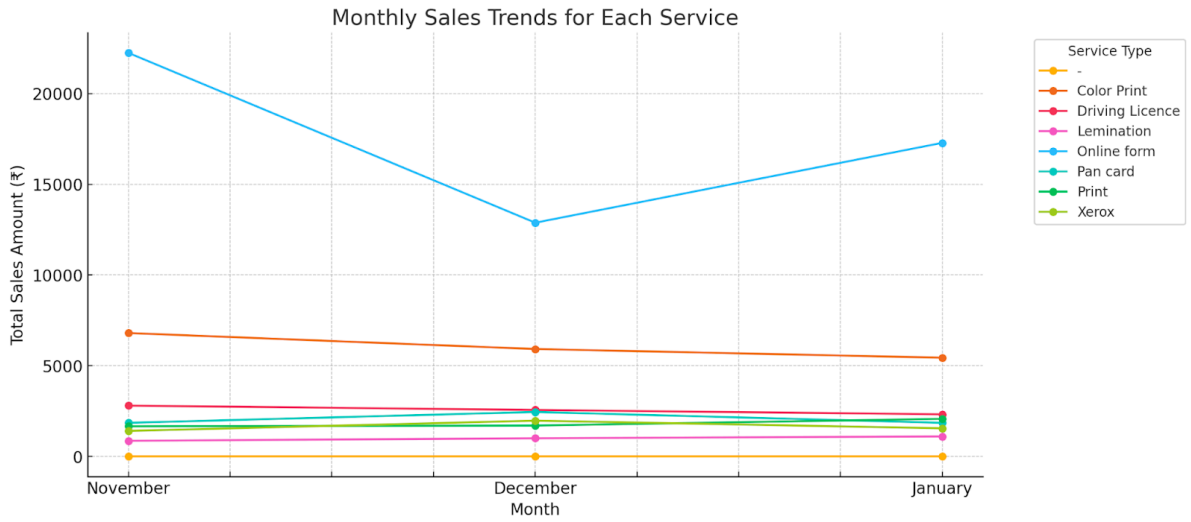
This Graph shows the trends between the revenue and month. This graph shows that the highest revenue in November month and the least revenue in December month. The Linear line shows the decreasing trend of revenue.

6.2 **Heat Map Monthly Services**



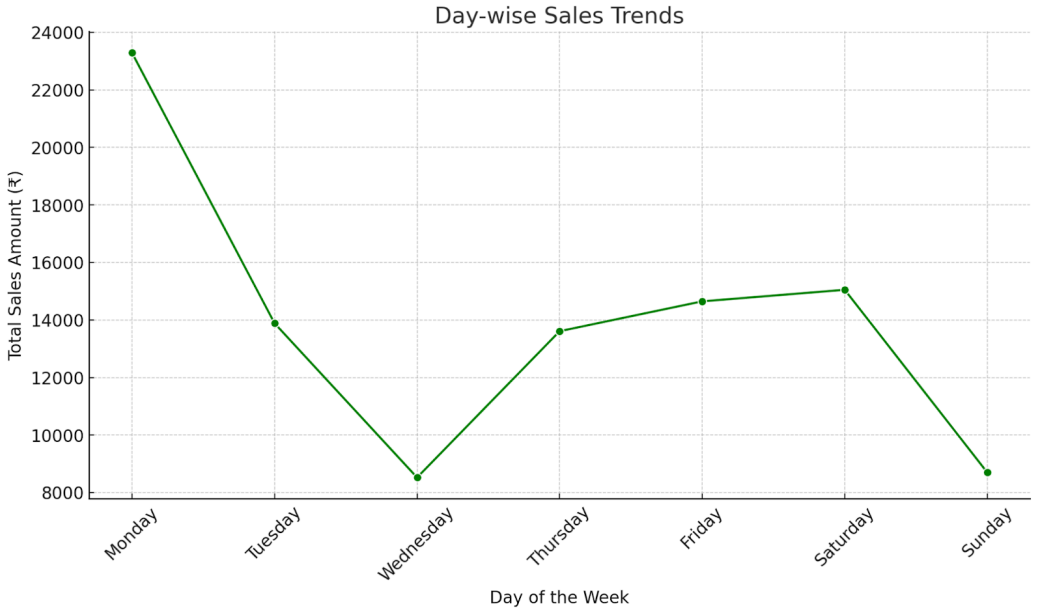
This heat map illustrates the revenue generated by each service across November, December, and January. Online Forms consistently generate the highest revenue, followed by Color Print and Driving License. Xerox and Printing services have relatively lower revenues, but their quantity might be high.

6.3 **Monthly Sales Trends for Each Service**



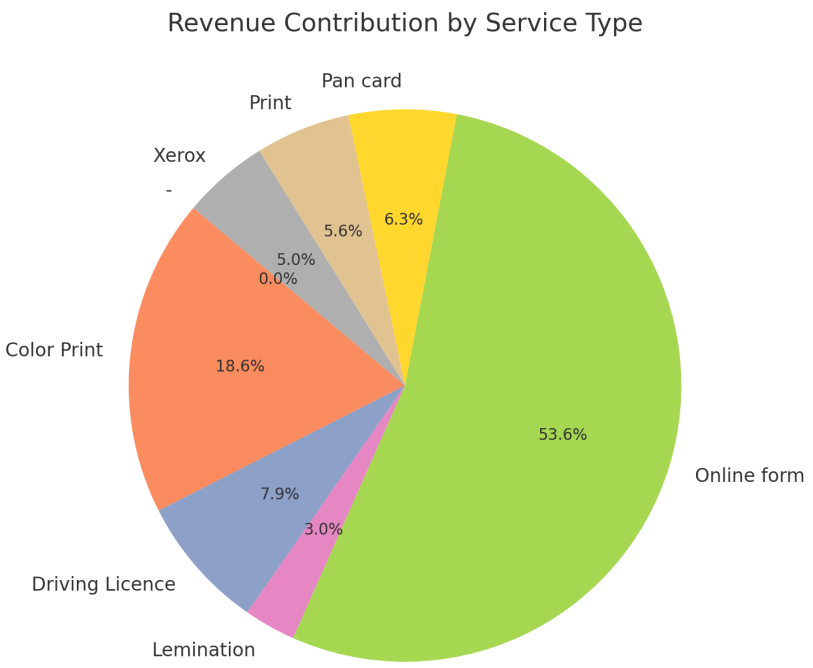
Online Forms show the most variation, peaking in November, dropping in December, and partially recovering in January. Color Print and Driving License have a steady decline across the three months. Xerox, Print, and Pan Card sales remain relatively stable with minor fluctuations.

6.4 **Day-wise Sales Trends**



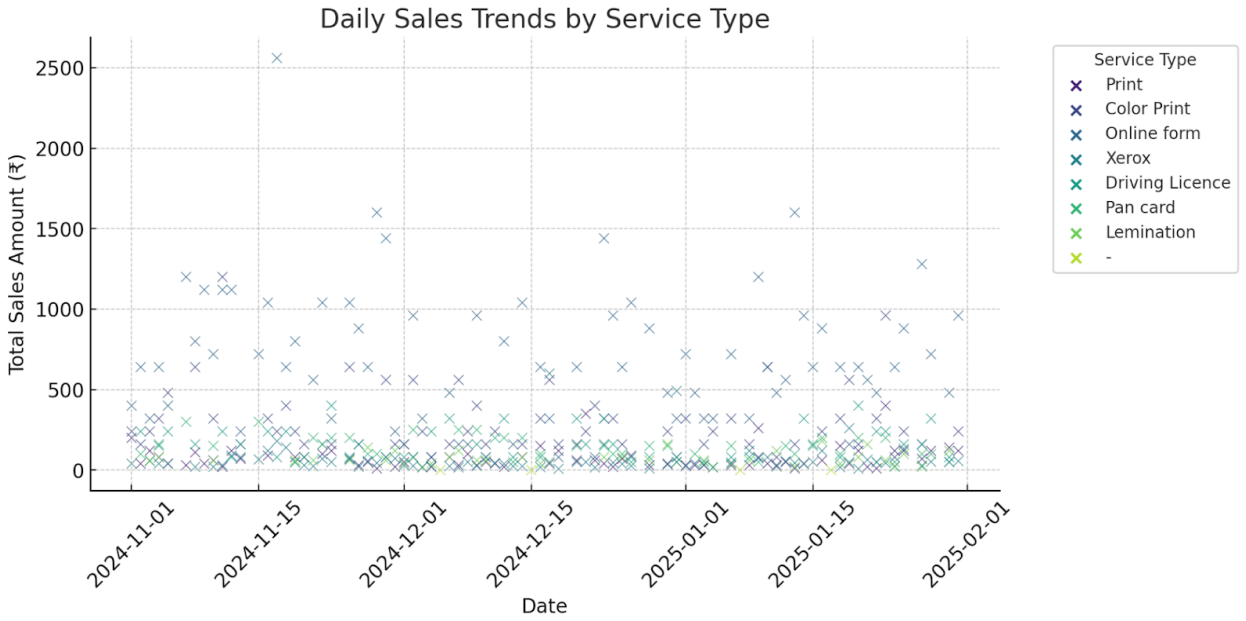
Monday has the highest sales, suggesting a strong demand at the beginning of the week.Sales drop significantly on Tuesday and Wednesday, indicating lower customer engagement. A gradual rise is seen from Thursday to Saturday, with Saturday being a relatively strong sales day. Sunday experiences the lowest sales, possibly due to reduced business activity.

6.5 **Revenue Contribution by Service Type**



Online Forms dominate revenue, accounting for over 50% of total earnings. Color Print and Driving License contribute significantly but much less than Online Forms. Xerox, Print, Pan Card and Lamination make up smaller portions of the overall revenue.

6.6 **Daily Sales Trends by Service Type**



The scatter plot highlights daily revenue trends across different services. Online Forms have the most significant revenue spikes on multiple days. Other services like Print, Xerox, and Driving License show a steady but smaller revenue contribution.