Data-Driven Insights into Credit Sales and Customer Dynamics in a Jewellery Store

A Mid Term report for the BDM capstone Project

Submitted by

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Contents

1 Executive Summary

This mid-term report presents a data-driven analysis of credit sales, customer behavior, and inventory dynamics for *Shri Giriraj Ji Jewellers*, a rural, unorganized jewellery store located in Bareilly, Uttar Pradesh. Operating in a traditional B2C model with all transactions manually recorded through handwritten bills, the business lacked the digital infrastructure needed for systematic insights into its operations.

To address this gap, over 985 handwritten sales bills and 297 credit entries—spanning a period of 42 months—were digitized. This enabled the first-ever structured analysis of sales trends, customer payment behavior, and inventory performance. Key findings reveal a classic Pareto distribution, where a small group of high-spending, frequent buyers contributes the majority of revenue. Product-level analysis highlights anklets (silver) and earrings (gold) as the primary revenue drivers, while items like toe rings and baby bangles show minimal impact.

Seasonality plays a major role, with sales peaking during wedding and festival seasons, particularly in December. Installment-based purchases, though popular, often suffer from delayed payments, negatively affecting cash flow. Exchange transactions were also found to be more common among high-value purchases.

The insights gained have already helped identify fast- and slow-moving products, enabling more effective inventory planning and refining installment and exchange policies. This project demonstrates the transformative value of digitization and analytics in a traditional retail setting, laying the foundation for more informed decision-making, targeted marketing, and eventual adoption of digital systems for sustainable growth.

2 Proof of originality of the Data

2.1 Details of Business

Business Name :- Shri Giriraj Ji Jewellers

Owner :- Mr. Rakesh Rastogi

Address:- Rajau Paraspur , Faridpur Road , Bareilly , Uttar Pradesh 243123

Contact info. :- +91 98977 40884

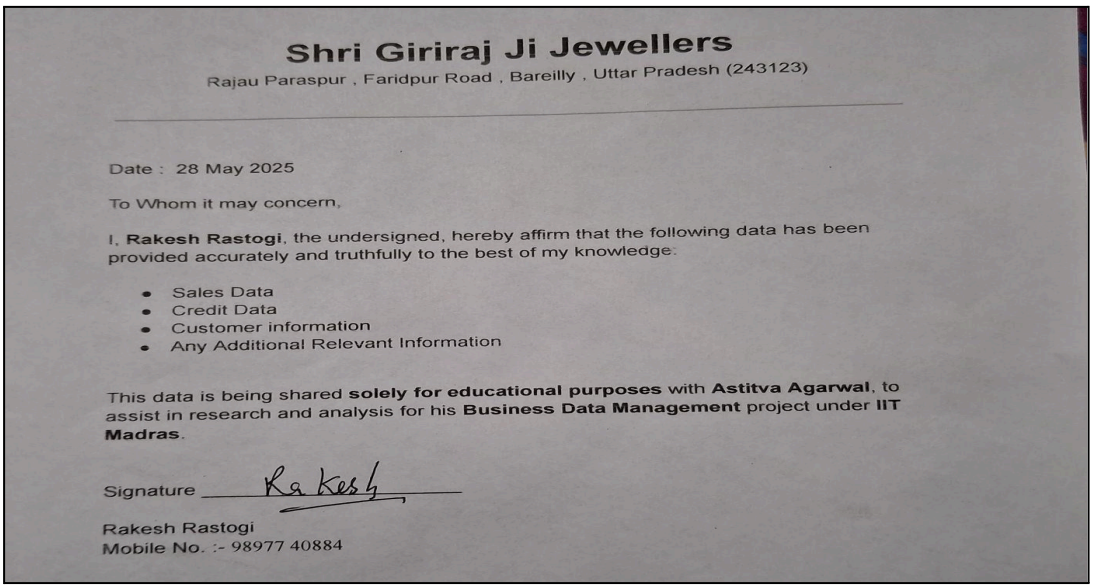
Shri Giriraj Ji Jewellers operates in a rural, unorganized retail environment, serving customers from nearby farming and village communities.It functions as a business-to-consumer (B2C) enterprise, offering a variety of gold and silver ornaments, some popular selling items are listed here : - Anklets (Payal) , Nose pins , Rings , Silver Belts , necklaces and pendants .

2.2 Images of Shop

In order to support my claims, I've attached some photographs of the shop , including the shop owner , the letter head .

Figure 1.1 Shop Entrance.

Figure 1.2 Shop owner Mr. Rakesh Rastogi



Shri Giriraj Ji Jewellers

Rajau Paraspur , Faridpur Road , Bareilly , Uttar Pradesh (243123)

Date : 28 May 2025

To Whom it may concern,

I, **Rakesh Rastogi**, the undersigned, hereby affirm that the following data has been provided accurately and truthfully to the best of my knowledge:

- Sales Data
- Credit Data
- Customer information
- Any Additional Relevant Information

This data is being shared **solely for educational purposes** with **Astitva Agarwal**, to assist in research and analysis for his **Business Data Management** project under **IIT Madras**.

Signature Rakesh

Rakesh Rastogi
Mobile No. :- 98977 40884

Figure 1.3 Letter Head.

2.3 A short video 3-8 mins interacting with the founder

23f2004131_BDM_Video.mp4

Drive Link : -
https://drive.google.com/file/d/1jW4ibrxxs6UQoxG5WfvRBX-l1oYPZfdw/view?usp=sharing

2.4 Primary Data

The data was collected in the form of handwritten bills and diary entries .To support my claims, I've attached some photographs of sales bills and credit records below .

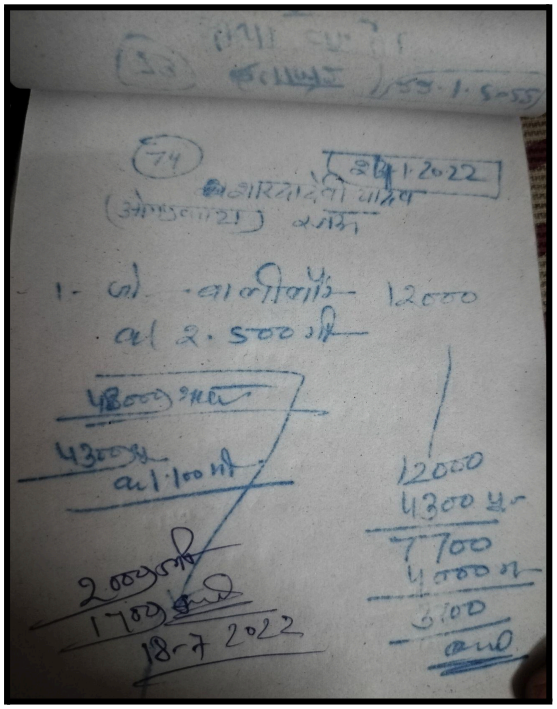


Figure 2.1 Sales Bill

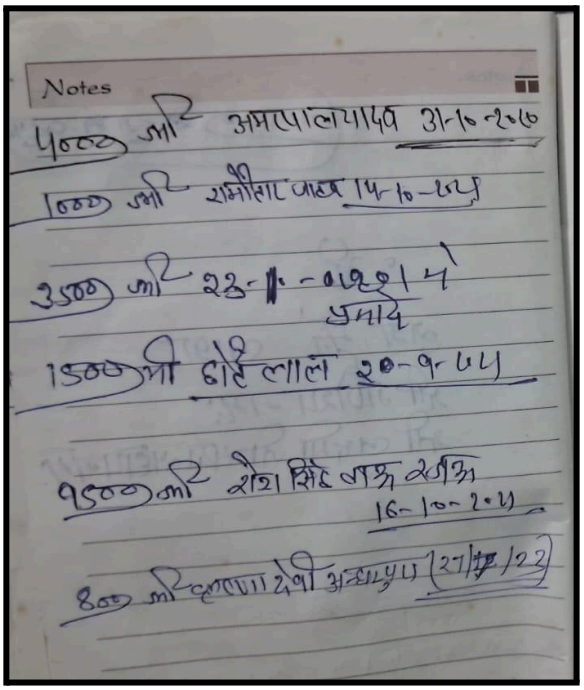


Figure 2.2 Credit record

3 Metadata

The sales data was initially received in raw, handwritten format, which required digitalization. Through this process, a total of 985 individual sales bills, spanning the period from December 2020 to November 2023, were compiled. During data collection, it was observed that there were no sales records for some months due to COVID-19 lockdowns. Additionally, a total of 297 credit entries were recorded. To streamline the analysis, the digitized data was further consolidated into bill-wise entries , narrowing the complex bill having several formulations and making the dataset more manageable and suitable for further analysis.

Both the Sales and Credit data are mentioned below in detail .

3.1 Credit data

Clean Dataset Link : 23f2004131_BDM_Credit_Data

Data collection duration : May-2020 to April-2025

Dataset Dimensions : The Dataset contains 3 columns and 297 rows

	Customer Name	Date	Amount paid by customer(₹)
2	UMESH	30/05/2020	₹1,500.00
3	RAMOTAR JATAV	14/10/2020	₹1,000.00
4	NEELAM	29/10/2020	₹2,000.00
5	AMAR PAL YADAV	31/10/2020	₹4,000.00
6	GUDDU KISAN	06/12/2020	₹600.00
7	TARAVATI	12/12/2020	₹1,000.00
8	RAMPAL	18/12/2020	₹300.00
9	RAJKUMARI	19/12/2020	₹2,500.00
10	DOCTER SAAB RAJAU	21/12/2020	₹1,000.00
11	KANDHAI MAURYA	24/12/2020	₹500.00
12	SATISH KUMAR	09/01/2021	₹6,000.00
13	SHER SINGH YADAV	11/01/2021	₹2,000.00
14	TARAVATI	18/01/2021	₹750.00
15	PRAMOD	23/01/2021	₹3,500.00
16	SHIV NANDAN	23/01/2021	₹4,100.00
17	RAM PAL	24/01/2021	₹1,500.00
18	RAJESHWARI SAXENA	28/01/2021	₹3,150.00
19	RAM PAL	31/01/2021	₹3,800.00
20	SAVITRI MAURA	31/01/2021	₹50.00

Figure 3.1 A Snapshot of how the Credit data looks like (First 20 entries)

Columns :

1. **Customer name : (String)** The customer name on which the bill and record is maintained.
2. **Date : (DD/MM/YYYY format)** This refers to the date on which the customers have made the payment for their respective products .
3. **Amount Paid by Customer(₹) : (Integer)** This is the amount that is deposited by the customer .

Description: This dataset is maintained for all the customers who purchased products on credit and then pays the amount remaining according to the installment plans , since there is no structured installment plan and due to rural customer base the customers tend to delay the amount , from this dataset and sales dataset we can do customer profiling and other analysis on customer and their payment behaviour across months to identify some useful and meaningful analysis that can help the business . During digitalization it was observed that some customers purchase 2 or more products at once from their name but they make the payment separately for each item making their name , amount and date similar but those are not redundant data . There are some outliers that are majorly for dates , in one of talk business owner mentioned , after having loss because of credit they limited the credit system for majority of customer and we can see the declining rate and volume over time that is causing outliers .

3.2 Sales Data

Clean Dataset Link : 23f2004131_BDM_Sales_Data

Data collection duration : May-2020 to Nov-2023

Dataset Dimensions : The Dataset contains 13 columns and 986 rows

	Customer Name	Date	Product name	Category	Weight(in gm.)	Rate /gm	Making/Labour charges	Discount	Total Amount(₹)	Payment Type	Number of Payments	Exchange Used	Exchange Value (₹)
2	SHERSINGH	09/12/2020	RING	GOLD	2.6	5100	₹0.00	₹0.00	₹13,260.00	Full	0	No	₹0.00
3	SHYAM BABU	09/12/2020	ANKLET	SILVER	50	62	₹100.00	₹0.00	₹3,200.00	Full	0	No	₹0.00
4	SATISH	09/12/2020	PENDANT	GOLD	2.01	5100	₹399.00	₹0.00	₹10,650.00	Full	0	No	₹0.00
5	RAMPAL	12/12/2020	RING	GOLD	1.39	5100	₹211.00	₹0.00	₹7,300.00	Full	0	No	₹0.00
6	GEETA	12/12/2020	TOE RINGS	SILVER	13	62	₹0.00	₹6.00	₹800.00	Full	0	No	₹0.00
7	TEJRAM	12/12/2020	NOSE PIN	GOLD	0.17	5100	₹33.00	₹0.00	₹900.00	Full	0	No	₹0.00
8	MEENA	12/12/2020	CHAIN	GOLD	15.5	5200	₹0.00	₹0.00	₹80,600.00	Full	0	Yes	₹45,500.00
9	TEJWATI	12/12/2020	CHAIN	SILVER	14	62	₹132.00	₹0.00	₹1,000.00	Full	0	No	₹0.00
10	NANDRAM	14/12/2020	ANKLET	SILVER	65	62	₹470.00	₹0.00	₹4,500.00	Full	0	No	₹0.00
11	ROOPESH YADAV	14/12/2020	ANKLET	SILVER	33	62.5	₹37.50	₹0.00	₹2,100.00	Full	0	No	₹0.00
12	GAYATRI MAURYA	16/12/2020	ANKLET	SILVER	183	62	₹654.00	₹0.00	₹12,000.00	Full	0	No	₹0.00
13	VIJAYPAL YADAAV	16/12/2020	NECKLACE	GOLD	14	5100	₹0.00	₹1,428.00	₹69,972.00	Full	0	Yes	₹20,043.00
14	VIJAYPAL YADAAV	16/12/2020	ANKLET	SILVER	157	62	₹0.00	₹0.00	₹9,734.00	Full	0	No	₹0.00
15	KANDHAI MAURYA	16/12/2020	BANGLE	SILVER	35	62	₹0.00	₹0.00	₹2,170.00	Full	0	No	₹0.00
16	RAJKUMARI	16/12/2020	ANKLET	SILVER	155	62	₹390.00	₹0.00	₹10,000.00	Full	0	Yes	₹5,500.00
17	VIRENDRA	17/12/2020	ANKLET	SILVER	56	63	₹472.00	₹0.00	₹4,000.00	Full	0	No	₹0.00
18	ROOPESH YADAV	17/12/2020	NOSE PIN	GOLD	0.3	5000	₹0.00	₹100.00	₹1,400.00	Full	0	No	₹0.00
19	NARESH	17/12/2020	ANKLET	SILVER	30	62.5	₹0.00	₹15.00	₹1,860.00	Installments	2	No	₹0.00
20	RAMPAL	19/12/2020	EARRINGS	GOLD	1.69	5100	₹181.00	₹0.00	₹8,800.00	Installments	2	No	₹0.00
21	LALA RAM	21/12/2020	ANKLET	SILVER	20	64	₹0.00	₹30.00	₹1,250.00	Full	0	No	₹0.00
22	AVDESH SHRIVASTAV	22/12/2020	ANKLET	SILVER	36	64	₹0.00	₹4.00	₹2,300.00	Full	0	No	₹0.00
23	SUMITRA KISAN	23/12/2020	ANKLET	SILVER	61	64	₹296.00	₹0.00	₹4,200.00	Installments	2	No	₹0.00
24	MOHIT JATAV	24/12/2020	NOSE PIN	GOLD	0.3	5250	₹25.00	₹0.00	₹1,600.00	Full	0	Yes	₹300.00
25	VIRENDRA	24/12/2020	NOSE PIN	GOLD	0.24	5250	₹0.00	₹60.00	₹1,200.00	Full	0	No	₹0.00
26	NARESH KISAN	24/12/2020	WAIST CHAIN	SILVER	68	63	₹0.00	₹84.00	₹4,200.00	Installments	2	No	₹0.00
27	SUDAMA	25/12/2020	BANGLE	SILVER	21	64	₹56.00	₹0.00	₹1,400.00	Full	0	No	₹0.00
28	NATHULAL	01/01/2021	ANKLET	SILVER	47	64	₹0.00	₹8.00	₹3,000.00	Installments	2	No	₹0.00
29	BHURE YADAV	01/01/2021	ANKLET	SILVER	41	65	₹235.00	₹0.00	₹2,900.00	Full	0	No	₹0.00
30	NATHULAL	01/01/2021	ANKLET	SILVER	27	65	₹45.00	₹0.00	₹1,800.00	Full	0	No	₹0.00
31	SHUKLAL MAURYA	01/01/2021	ANKLET	SILVER	205	65	₹0.00	₹325.00	₹13,000.00	Full	0	Yes	₹4,200.00
32	KANDHAI MAURYA	02/01/2021	NECKLACE	SILVER	43	64	₹398.00	₹0.00	₹3,150.00	Installments	2	Yes	₹200.00
33	RAJESHWARI SAXENA	03/01/2021	PENDANT	GOLD	1	5200	₹0.00	₹0.00	₹5,200.00	Installments	0	No	₹0.00
34	RAJU MAURYA	03/01/2021	NOSE PIN	GOLD	0.26	5200	₹48.00	₹0.00	₹1,400.00	Full	0	Yes	₹500.00
35	KANTA PRASAD	05/01/2021	EARRINGS	GOLD	1.35	5300	₹345.00	₹0.00	₹7,500.00	Full	0	No	₹0.00
36	CHANCHAL KISAAN	07/01/2021	EARRINGS	GOLD	1.38	5350	₹617.00	₹0.00	₹8,000.00	Installments	2	No	₹0.00
37	SHAKUNTALA	09/01/2021	ANKLET	SILVER	63	67	₹0.00	₹221.00	₹4,000.00	Installments	3	No	₹0.00
38	NATHULAL	09/01/2021	BANGLE	SILVER	33	67	₹389.00	₹0.00	₹2,600.00	Full	0	No	₹0.00
39	REKHA MISHRA	13/01/2021	BANGLE	SILVER	22	67	₹76.00	₹0.00	₹1,550.00	Full	0	No	₹0.00
40	LALA RAM	13/01/2021	ANKLET	SILVER	115	64	₹40.00	₹0.00	₹7,400.00	Full	0	No	₹0.00

Figure 3.2 A Snapshot of how the Sales data looks like (First 40 entries)

Columns :

1. **Customer Name : (String)** The customer name on which the bill and record is maintained.
2. **Date : (DD/MM/YYYY format)** This refers to the date on which the customers have purchased the product and bill was created .
3. **Product name : (String)** This column specifies the name of the product purchased . Example :- Anklets , Nose Pin , Waist Chain , Pendants etc . Some bills were having combined weight of 2 different products , while digitalisation both were written in the same row entry separated by comma .
4. **Category : (Gold/Silver) :** This column tells about the category of product defining whether the product is made of gold or silver metal .
5. **Weight(in gm.) :** This column specifies the Exact weight of the product till 3 decimal points . There are products ranging from 0.1 grams (i.e. 100 milligrams) to hundreds of grams in weight .
6. **Rate /gm :** This column provides the unit rate of the metal on the specific date that was used for calculating the actual price of the product . The rates are mentioned per gram , Example :- 5100 per gram on 9th dec 2020 . The price fluctuates every time .

In order to maintain the price consistent for all the shops the jewellery committee of the region daily decides the rate for the day .

7. **Making/Labour charges :** There are different varieties and qualities of a single product having different labour charges .
8. **Discount :** Since the shop operates in rural areas the customers ask for heavy discounts for being a loyal customer , leaving no option for the owner other than giving discounts . Sometimes the discount provided to the customer is so big that the owner has to reduce all the making charges and other charges .
9. **Total Amount(₹) :** This is the Total amount the customer has to pay . The formula for finding total amount is [(weight * Rate) + making charges - Discount] .
10. **Payment Type :** This refers whether the customer has paid the full amount while purchasing or has opted for any installment plans .
11. **Number of Payments :** It refers to the number of payments made by the customer after purchase . The values are zero for the customers whose payment type is full .
12. **Exchange Used :** Payment to the shop owner can be done by different types of cash , online and old silver or gold so if a customer purchases any gold product then they can use their old gold ornaments as a type of payment . so this column tells whether the exchange was used or not .
13. **Exchange Value (₹) :** If the Exchange used option was opted "Yes" then the cell contains the amount that will be equal to the item provided by the customer . Now that amount will be deducted from the total amount and the rest of the payment (if any) will be paid by cash or included with installment . Otherwise the value will be zero .

Description: This dataset is maintained for all the customers who purchased products either they have paid the full amount or opted for an installment plan . While transforming the data from handwritten bills to google sheets I have taken care of many things and made the data in a way which will not only be easy to understand but will also help in analysing the data . The major challenge was related to making charges , discounts and total amount . The major profit percentage lies in making charges and in the purity of the metal , because pure metals are soft as compared to others . But the customer want heavy discounts so the business owner remove making charges the issue is that there were no making charges explicitly mentioned in the bill so i have no idea how much discount were made by reducing the making charges so if the customer is purchasing the product from per gram rate then both the making charges and discount cells are given 0 . If there is any amount above that , it will be reflected in making charges and discount will be provided 0 , and if the amount goes below that , then it will be reflected in discount cells and making charges are provided 0 there . For Example a customer purchased a gold ring of 5 gms the gold rate on that day was 5000 inr per gram so the amount will be 5 * 5000 i.e. 25000 + making charges now these making charges are not mentioned in the bills so i have assumed that any amount above 25000 will be making charges and no discount is given and any amount below 25000 will be discount and no making charges were added .

4 Descriptive Statistics

To understand the distribution of payments made by customers, descriptive statistics was performed on the dataset having a total of 296 transactions , the findings are as follows

Total Payments Recorded: 296

Average Installment Paid: ₹2,524.49

Most Common Payment Range (Middle 50%): ₹1,000 to ₹3,000

Minimum Installment: ₹50.00

Maximum Installment: ₹26,000.00

Median Payment: ₹1,500.00

Summary Statistics image link : Descriptive Statistics of Credit and sales data.png

Now the sales Statistics are based on different categories i.e. gold and silver .

Product Categories Distribution

Category	Frequency	Percentage
Silver	594	~ 60%
Gold	391	~ 40 %

Silver jewellery accounts for the majority of the transactions in the dataset.

Gold Products :

Average rate per gram : ₹5053.4/gm .

Average weight of gold item purchased :

Mean: 1.9 gms

Min: 0.100g (Nose Pin)

Max: 15.5g (Chain)

Total Amount Paid

Minimum: ₹550(Nose Pin)

Maximum: ₹80,600.00 (Chain)

Average : ₹9,549

Payment Type Distribution for Gold

Payment Type	Count	Percentage
Full	238	61%
Installments	153	39%

Most customers paid in full, with a smaller segment opting for installment payments.

Exchange Transactions for gold

Exchange Used	Percentage	Average Exchange Value (₹)
Yes	29 %	₹ 6289
No	71 %	₹ 0

Silver Products :

Average rate per gram : ₹63.5/gm .

Average weight of silver item purchased :

Mean: 64.9 gms

Min: 4 gms (Ring)

Max: 295gms (Anklet)

Total Amount Paid

Minimum: ₹300 (Ring)

Maximum: ₹21,500(Waist Chain)

Average : ₹4,233

Payment Type Distribution for silver

Payment Type	Count	Percentage
Full	434	73
Installments	160	27

Most customers paid in full, with a smaller segment opting for installment payments.

Exchange Transactions for silver

Exchange Used	Percentage	Average Exchange Value (₹)
Yes	34%	₹ 2656
No	66%	₹ 0

5 Detailed Explanation of Analysis Process/Method

5.1 Data Cleaning and Preprocessing

Process:

The Bills were 5 years old so there was very difficulty understanding the carbon print since some values were not readable so the data was transformed with those values missing that were not readable or not written example some bill don't have the rate per gram so we check the previous or next bills for the rate and cross check it with the calculation , also because of no proper making charges stated the formulations were going wrong so i improved it in a way that won't affect the overall analysis it has been mentioned in detailed in description of sales metadata for better context .

Justification :

Cleaning ensures accuracy and consistency , while preprocessing provides better data for analysis reducing the risk of errors and maximising the analytical approach . For a small jewellery shop like Shri Giriraj ji Jewellers , where resources are limited it is essential to understand the overall customer base and choices paired up with multiple options to better identify which can make it easier for the shop owner to implement those changes and improve the situation .

5.2 Descriptive Statistics Analysis

Process: Descriptive statistical methods are applied to Key variables in sales and credit data , which includes Frequency , mean(Average sales of products in different categories) , median , Range to identify the customer behaviour . These statistics were computed for each category and their products over a 42 month period with the advanced excel /sheets tools and python language and pandas library . This helped evaluate the demand consistency , price to customer retention etc .
Example : When gold price increases customers tend to purchase gold on installment or buy silver , which shows the market effect of pricing increase .

Justification : This step provides a detailed understanding of each category and its product range , weight . During the wedding season , Festivals like Diwali customers tend to purchase more things like coins , god idols , and all the fast moving items like anklets , earrings , etc during which shop owner needs to increase the inventory for dealing customers better and having a large variety can make a deal with the customer and not losing it .

5.3 KPI Analysis

Process : Key Performance Indicators (KPIs) such as Average Transaction Value per category and its different products , Best-Selling Items by Category were calculated using the sales data over a 42 month period

Average Transaction Value = Total Sales Value / Number of Transactions
Best-Selling Items by Category = Ranking SKUs based on quantity and revenue contribution

These metrics were visualized using bar graphs and pie charts to easily identify high and low performers.

Justification : These KPIs are essential for a jewellery company with high-value inventory and moderate sales frequency. Monitoring Inventory Turnover ensures maximizing working capital and liquidity. Average Transaction Values ensures recognizing high-value categories and cross-selling opportunities. Best-Selling Items assists in prioritizing stock management and promotional attention.
In relation to overall trend analysis, KPI analysis gives targeted, actionable figures that directly relate to profitability and efficiency of operations.

5.4 Qualifier Algorithm & Forecasting

Process: A rule-based Qualifier Algorithm was applied to segment products into: High-Moving, Slow-Moving, Random Demand. This was done by calculating the sales frequency, average monthly sales, and standard deviation across SKUs. Historical sales data (past 42 months) was used to detect seasonality and demand trends using time-series decomposition methods. Forecasting was performed using Moving Average technique to predict demand for each product category, especially ahead of festival seasons and wedding months. In the later stages of the project, more advanced forecasting models such as ARIMA and seasonal decomposition were explored to capture trend and seasonality patterns more accurately, enhancing the robustness of predictions based on historical volatility and recurring peaks.

Justification : Segmenting products by demand pattern ensures targeted inventory and promotion. High moving can be kept with larger stock and variety while slow moving needs to be unique and discounted that attracts customers. Forecasting based on past years' data—especially incorporating seasonality—is more effective in comparison to past averages, particularly in the jewellery market where trends are influenced by festivals and weddings. This method reduces overstock and stockouts, improving inventory decisions for both high- and low-value items.

5.5 Customer Profiling

Process: Customer transaction data was analyzed to develop profiles based on: Purchase Frequency , Preferred Product Categories ,Installment Payment Behavior ,Repeat vs. One-time Buyers ,Exchange Behaviour (Jewellery Trade-ins). Clustering methods like K-means were used to group customers into behavior-based segments (e.g., High-Spenders, Seasonal Buyers, Installment Users, Exchange-Focused Buyers). Exchange Impact was assessed by comparing transaction values and margins between new purchases and trade-ins.

Justification : Understanding customer behavior helps in personalized marketing and loyalty strategy. For example, frequent installment users can be targeted for financing plans, and trade-in customers can be offered exclusive upgrade deals. Compared to basic demographic segmentation, this approach uses behavioral analytics, which is more powerful in shaping sales at the shop region and helping understand the customer base of the shop.

6 Results and Findings

Below is the Customer Segmentation by Spend & Frequency chart. By looking at the chart it can be identified that silver has more units sold in comparison to gold. Let's first look at silver . Anklets overall has a major portion in jewellery shops with around 444 units sold with an average weight of 71.5 gms having a wide range of 14 gms to 260 gms , then comes bangles with only 48 units sold , the numbers are clearly showing a difference of 10 times. Then comes Baby bangles and waist chains both having 20 units sold and the other items like chain , toe rings , bracelets , coins , god idols are very low and can be considered as on demand items .

If we take a look at Gold portion the case is not like silver it has a variety of products , Moving on with earrings a total of 131 units were sold with an average weight of 1.720 gms , as stated by shop owner that there are a variety of earrings so it would be recommended to make a good stock of earrings for weight 1.5 gms to 2 gms . A total of 90 Nosepin were sold during the 42 month period with an average weight of 0.332 gms that means these are preferred with low weight so maintaining a high variety of these will be beneficial too it wont cost much in case of other heavy weighted products in the inventory .

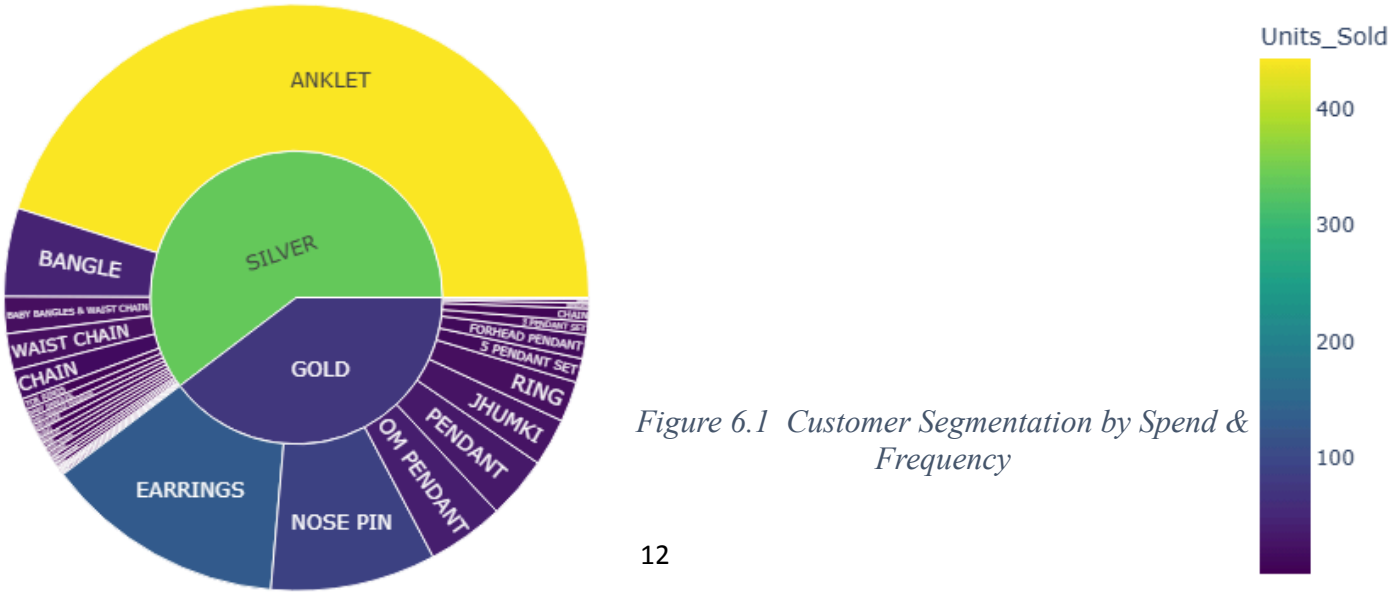


Figure 6.1 Customer Segmentation by Spend & Frequency

Overall , it can be interpreted that gold products have a variety of products sold like different types of earrings , Jhumki , Nosepins 6 and remaining major portions are also different types of pendants like om pendant , 3 pendant set , 5 pendant sets . They don't have much frequency difference as compared to the anklet and other silver products .

Best-Selling Products

Average Transaction Value by Category and Best-Selling Products charts revealed that products like ANKLET and EARRINGS are the primary revenue drivers for Shri Giriraj Ji Jewellers.
Inventory Turnover insights, derived from sales frequency and revenue, highlighted which items are high-moving and should be prioritized for restocking. This ensures that fast-selling products are always available, directly supporting inventory efficiency.

These KPIs provided clear, actionable metrics that can be used to improve profitability and guide inventory management decisions.

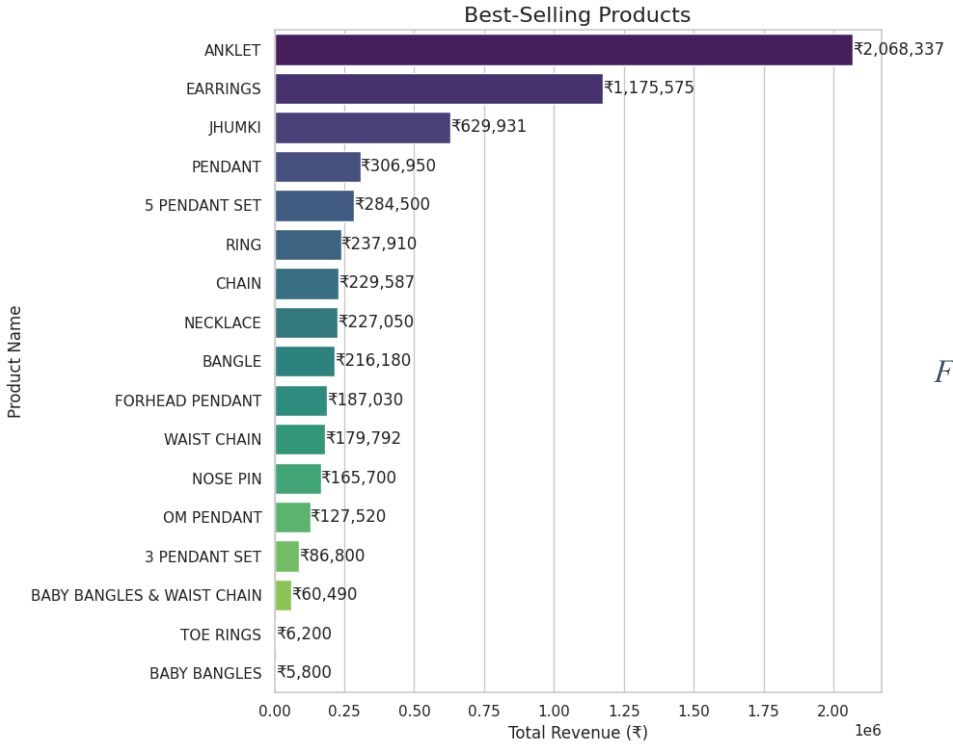


Figure 6.2 Best-Selling Products

Customer Profiling

Three main customer groups are visible:

- High spenders with frequent purchases
- Moderate spenders
- Low spenders with infrequent purchases

A small segment of high spenders accounts for a large share of total revenue.

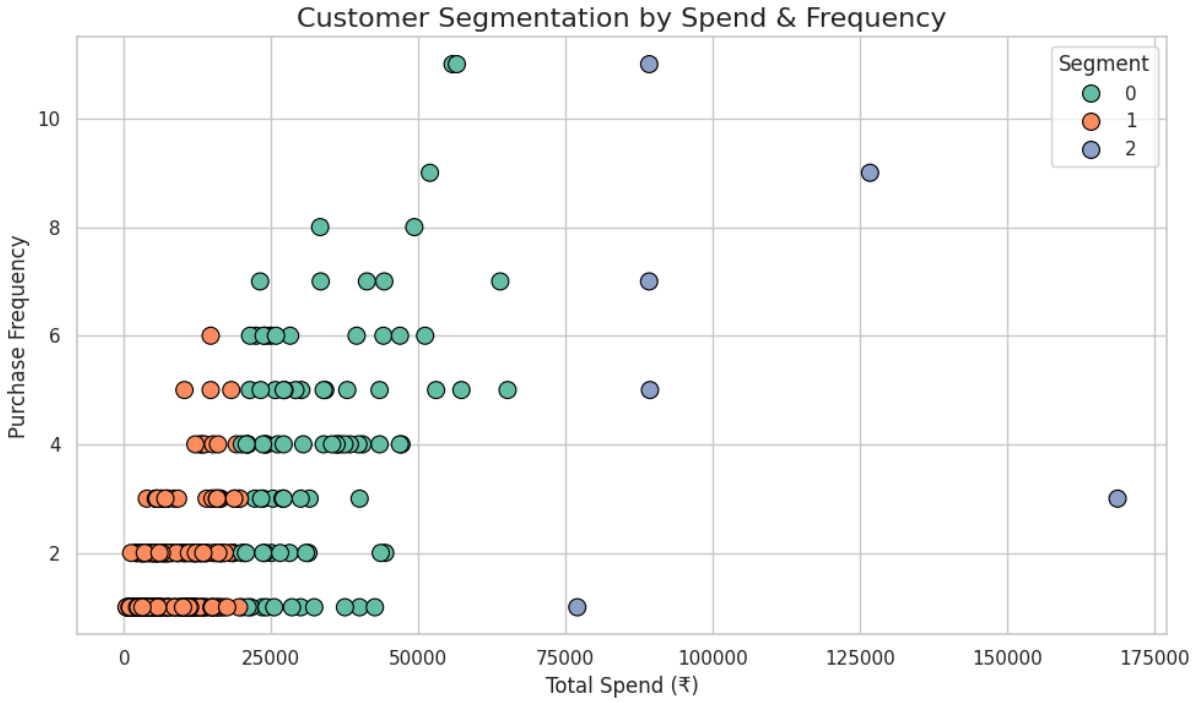


Figure 6.3 Customer Segmentation by spend and Frequency

Cluster 1: High-Value Loyalists : These customers are in the upper-right of the chart. They purchase frequently and have the highest total spend.They form a small group but contribute a disproportionately large share of revenue.Example: A few customers with >10 purchases and total spend above ₹100,000.

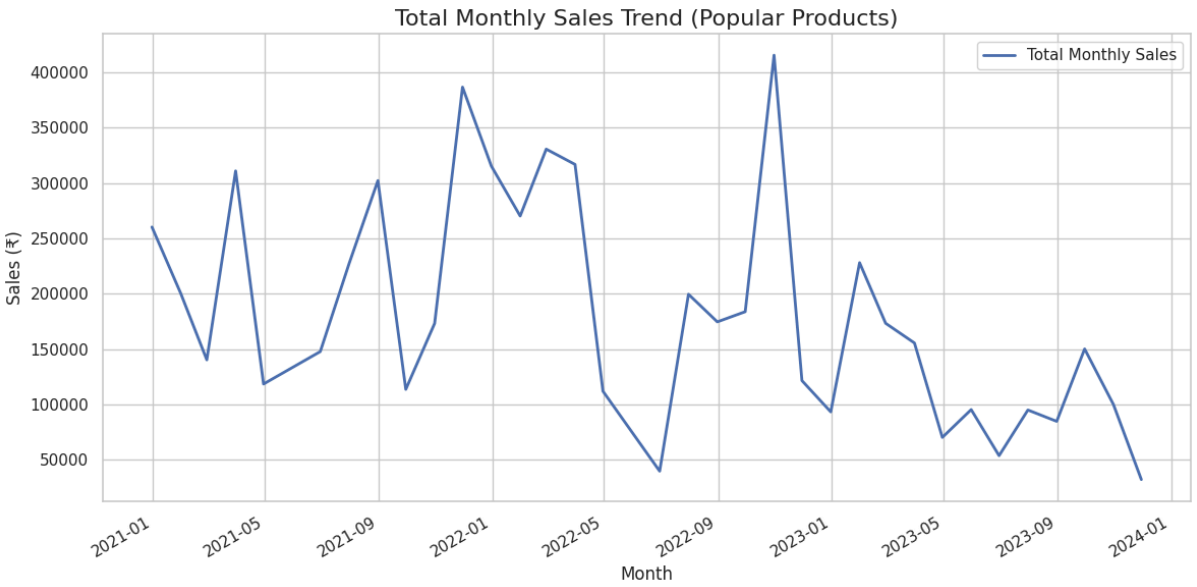
Cluster 2: Occasional Spenders : Located in the middle of the chart.Moderate purchase frequency (3–6 purchases) and moderate spend.They are steady contributors to revenue but not as critical as the high-value group.

Cluster 3: Low-Value/One-Time BuyersClustered in the lower-left. Low spend and purchase frequency (often just one or two purchases).This is the largest group by number but contributes the least to total revenue.

Total Monthly Sales Trend (Popular Products):

Highest sales peaks occurred in December 2021 and December 2022, both exceeding ₹400,000, indicating strong demand during these months—likely due to wedding and festival seasons.Other notable high sales months include September 2021, November 2021, and February 2022, each with sales above ₹300,000.
Sharp drops are seen after each major peak, with the lowest sales (below ₹50,000) in June 2022 and December 2023.Overall trend: Sales are volatile month-to-month, with clear periodic spikes followed by declines. After early 2023, sales show a gradual downward trend, with fewer and lower peaks.

It is recommended to focus inventory and marketing efforts on months with consistent high sales (especially December and festival periods), and investigate causes for the sales decline in late 2023.



All the Data and relevant Graphs are present in Drive Folder :

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