Analysis to increase the sale in aluminum and glass trade business

The Final report for the BDM capstone Project

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1. Executive Summary

Ohm Sai Aluminium House is medium size shop dealing with raw aluminium, glass , mica and hardware product like lock, screw and doors. The shop was started by Pramod Mehta, and currently, it employs 2 workers in shop and 1 for handling delivering the product for some customers. The shop serves both B2B and B2C clients increasing range of customers.

Main issue the shop business is facing is balancing the growth with maintaing the quality of products as there are many customers demand lower qualities products for cheaper price which conflicts with the shop values. Regards this issue the data collected include sales volume and sales value of product like aluminium, glass, mica and hardware. Hardware includes lock, screw and doors.

Analysis of sales volume interprets that shop has constant amount of transaction which shows shop has good performance. Average sales volume is 489.65 units which indicates healthy business. However, data shows fluctuation in regular transaction of sales value, likely due to seasonal changes. And same fluctuation can be seen in sale value data.

Analysing preferences for price versus qualities, it concluded that there is requirement to adjust price strategy for certain product to better align with customer demands.

The tools used for analyse were:

- Excel: for basic calculations and organizing the data.
- Python libraries:
- Pandas: to organize and manipulate data efficiently.
- Numpy: to performing calculations and identifying patterns in the data.
- Matplotlib: to create visual representations, such as charts and graphs, to highlights trends and insights.

2. Analysis process

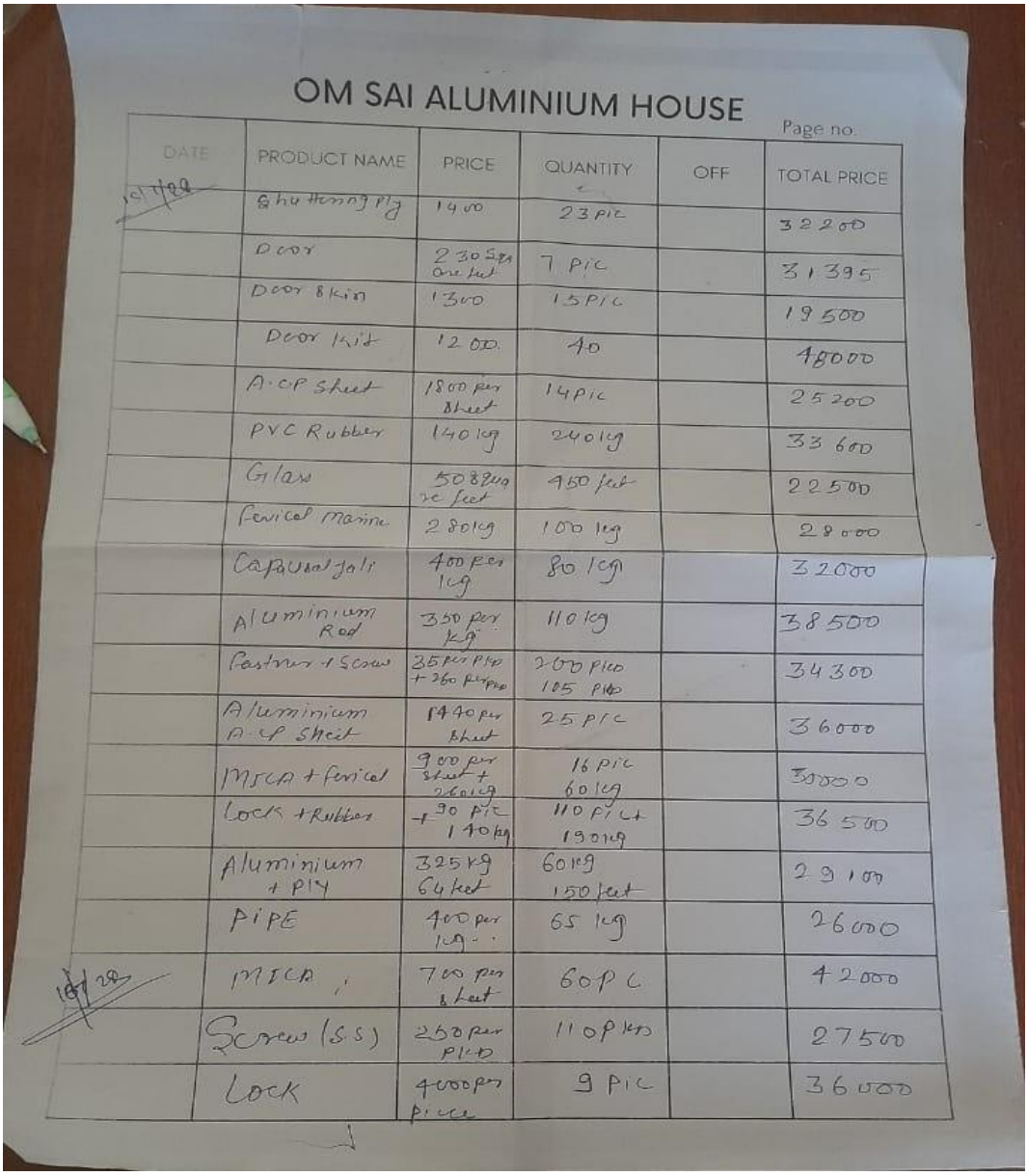
For analysing the data for shop of ohm Sai Aluminium House, process can be breakdown on two parts: Data collection and preparation , and Data Analysis.

2.1 Process of Data collection and preparation

Understanding the core issue in shop helps to know the data we need to collect. For shop main issue is finding a balance growing the business and keeping the product quality high at Ohm Sai Aluminium House. The business is about product like raw aluminium, glass, mica and hardware products. The main problem is that some customers want high-quality products, many others are looking for cheaper, low quality options. This create a problem because shop value are to sell high quality, but it hard to grow the business when many customers just want to pay less for lower quality products.

The data collected include the following:

- Sales volume: the number of unit sold for each product category over time. For aluminium in Kg, mica in piece, ply in feet, glass in square feet and hardware in pieces.
- Sales value: The revenue generated from selling product during over time.
- Time factors: To account for seasonal change, data was gathered over long enough to detect fluctuations.
- Customers Feedback: information on customer preferences whether they prefer low quality, lower cost product or high quality, high cost alternatives.



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DATE	PRODUCT NAME	PRICE	QUANTITY	OFF	TOTAL PRICE
	Shuttering Ply	1400	23 pic		32200
	Door	2300 per one set	7 pic		31395
	Door skin	1300	15 pic		19500
	Door kit	1200	40		48000
	A.C.P Sheet	1800 per sheet	14 pic		25200
	PVC Rubber	140 kg	240 kg		3360
	Glass	5088 per sq feet	450 feet		22500
	Fevicol marine	280 kg	100 kg		28000
	Capusul jali	400 per kg	80 kg		32000
	Aluminium Rod	350 per kg	110 kg		38500
	Pastner + Screw	35 per pkt + 260 per pkt	200 pkt 105 pkt		34300
	Aluminium A.C.P Sheet	1440 per sheet	25 pic		36000
	MICA + fevicol	900 per sheet + 260 kg	16 pic 60 kg		30000
	Lock + Rubber	90 pic + 140 kg	110 pic + 190 kg		3650
	Aluminium + ply	325 kg 64 feet	60 kg 150 feet		2910
	PIPE	400 per kg	65 kg		26000
	MICA	700 per sheet	60 pc		42000
	Screw (S.S)	250 per pkt	110 pkt		2750
	Lock	4000 per piece	9 pic		36000

Data is collected in tabular form, as provided by me, which include the following:

- Date
- Product name
- Price
- Quantity(sales volume)
- Total price(revenue)

After collecting data it must be cleaned and organized. Organizing data by dates to track sales trends over time. Tools like excel and python libraries (panda) is used to clean and organize this data, structuring it into a format suitable for analysing.

Date	Week	Product Name	Sales Volume	Sales Value (in INR)
08-04-2024	1	Aluminium	460	₹ 1,49,500.00
02-04-2024	1	Mica	160	₹ 1,04,000.00
08-04-2024	1	Ply	450	₹ 4,50,000.00
08-04-2024	1	Glass	670	₹ 33,500.00
08-04-2024	1	Hardware	600	₹ 12,00,000.00
15-04-2024	2	Aluminium	450	₹ 1,46,250.00
15-04-2024	2	Mica	400	₹ 2,60,000.00
15-04-2024	2	Ply	550	₹ 5,50,000.00
15-04-2024	2	Glass	500	₹ 25,000.00
15-04-2024	2	Hardware	750	₹ 15,00,000.00
22-04-2024	3	Aluminium	450	₹ 1,46,250.00
22-04-2024	3	Mica	230	₹ 1,49,500.00
22-04-2024	3	Ply	780	₹ 7,80,000.00
22-04-2024	3	Glass	540	₹ 27,000.00
22-04-2024	3	Hardware	640	₹ 12,80,000.00
29-04-2024	4	Aluminium	410	₹ 1,33,250.00
29-04-2024	4	Mica	450	₹ 2,92,500.00
29-04-2024	4	Ply	670	₹ 6,70,000.00
29-04-2024	4	Glass	540	₹ 27,000.00
29-04-2024	4	Hardware	620	₹ 12,40,000.00
06-05-2024	5	Aluminium	540	₹ 1,75,500.00
06-05-2024	5	Mica	210	₹ 1,36,500.00
06-05-2024	5	Ply	590	₹ 5,90,000.00
06-05-2024	5	Glass	640	₹ 32,000.00

2.2 Data Analysis

Sales volume analysis:

The very first step to analysing sales volume is to identify the transaction patterns:

- Average sales volume: Shop sells average of 489.65 units of items indicates consistent performance of business.
- Sales stability: The sales data shows that shop has steady flow of transactions which show good demand of items.

- Seasonal variation: The data suggest seasonal trends, where sales of certain product, such as doors or hardware rise during construction periods, while aluminium and glass during off seasons. During summer the demands for glass and aluminum tends to decrease as construction activities slow down due to high temperatures.

  Tools uses:

- Pandas and numpy: for calculating average and trends identifications.
- Matplotlib: for visualizing sale data over time, highlighting seasonal trends.

  Sales value Analysis:

  Now, analyse sales value data to understand revenue patterns:

- Average Sales value: The shop average revenue is ₹ 417737 which show good amount of revenue for a medium scale business.
- Revenue fluctuation: just like sales volume, the sales value fluctuates over time, likely due to seasonal changes. For instance, revenue increases during high demand periods and decreases in off seasons.
- Profitability challenge: Despite good sales volume, profit might suffer due to customer preference for cheaper, lower quality products. This highlights that high sales volume doesn't always translate into high revenue.

  Tools used:

- Excel or pandas: for calculating total revenue and comparing it across different periods or products.
- Matplotlib: For creating visual comparisons, such as bar charts representing revenue from each product type.

  Customer preference:

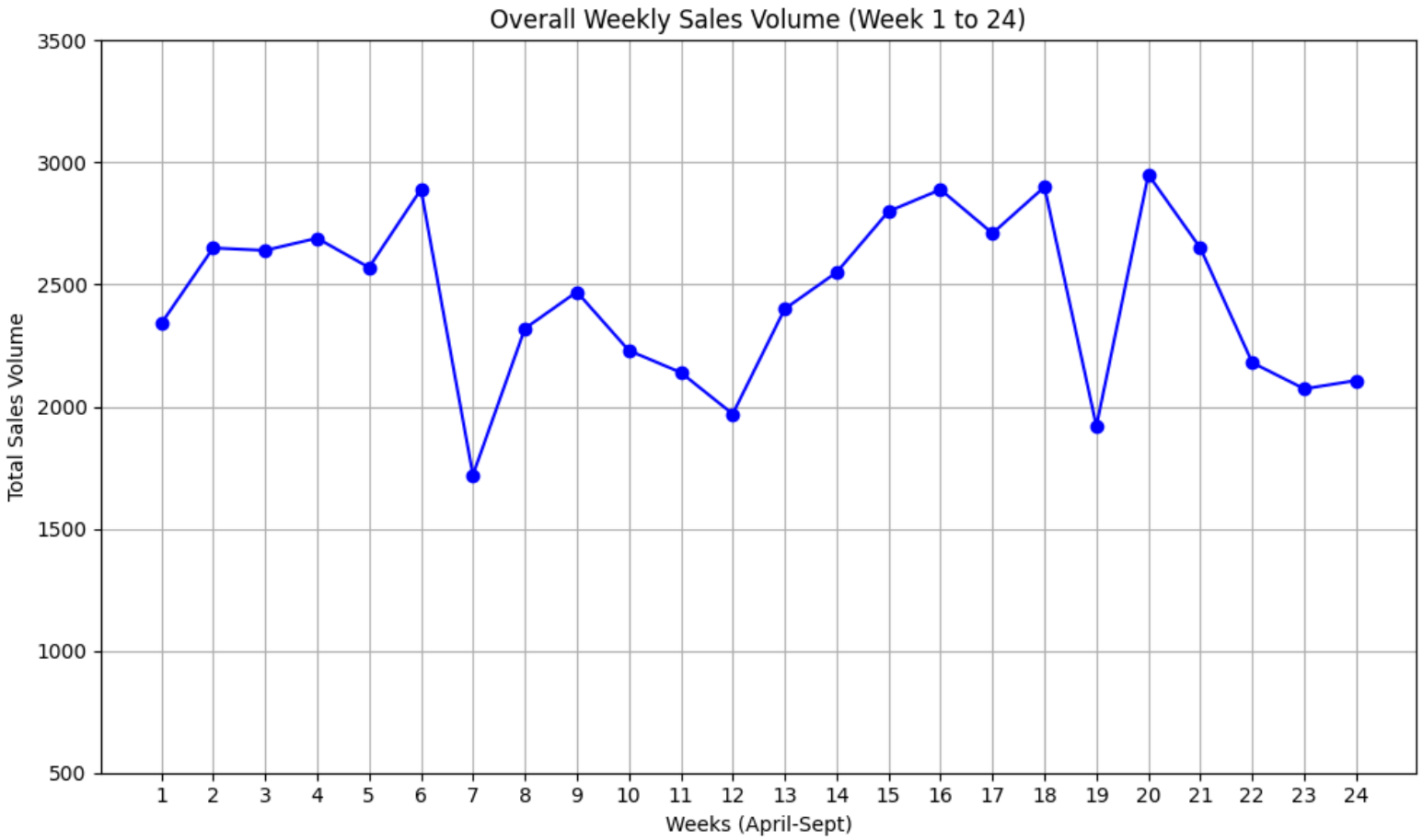
- Price vs Quality: for some specific product in hardware like doors, lock, screws customers prefer to cheaper products leads to have more selling of certain products. This shows that price is often more prioritze to them than quality.
- Product patterns : Different products sell differently. Hardware like door, skin, lock or screws have steady performance while aluminium and glass have more fluctuations. Aluminium and glass products mainly depends on project like currently there is two

flyover construction near shop which increase B2B business to shop. There is also shifting of more workers near town increase in reconstruction of house for rent.

It concluded that shop is struggling to balancing high quality products with customer demand for cheaper products.

3. Findings:

Sales volume trend Analysis:



Observation:

- Consistence start(week 1-6): The sales volume starts off very stable, with tight bound between 2500 to 3000 unit for first few weeks.
- Sudden drop(week 7): There is a sharp decrease in sales during week 7,where sales volume drop to below 2000 units.
- Quick recovery(week 8-9): Following the drop, sales quickly recover, reaching peak of 2500 units in week 9.
- Gradual Decline (week 10-12): After week 9 sales starts decreasing over next few weeks, reaching low point at week 12.
- Growth surge(week 13-17): from week 13, there is gradual rise in sales, peaking 3000 units during week 17.

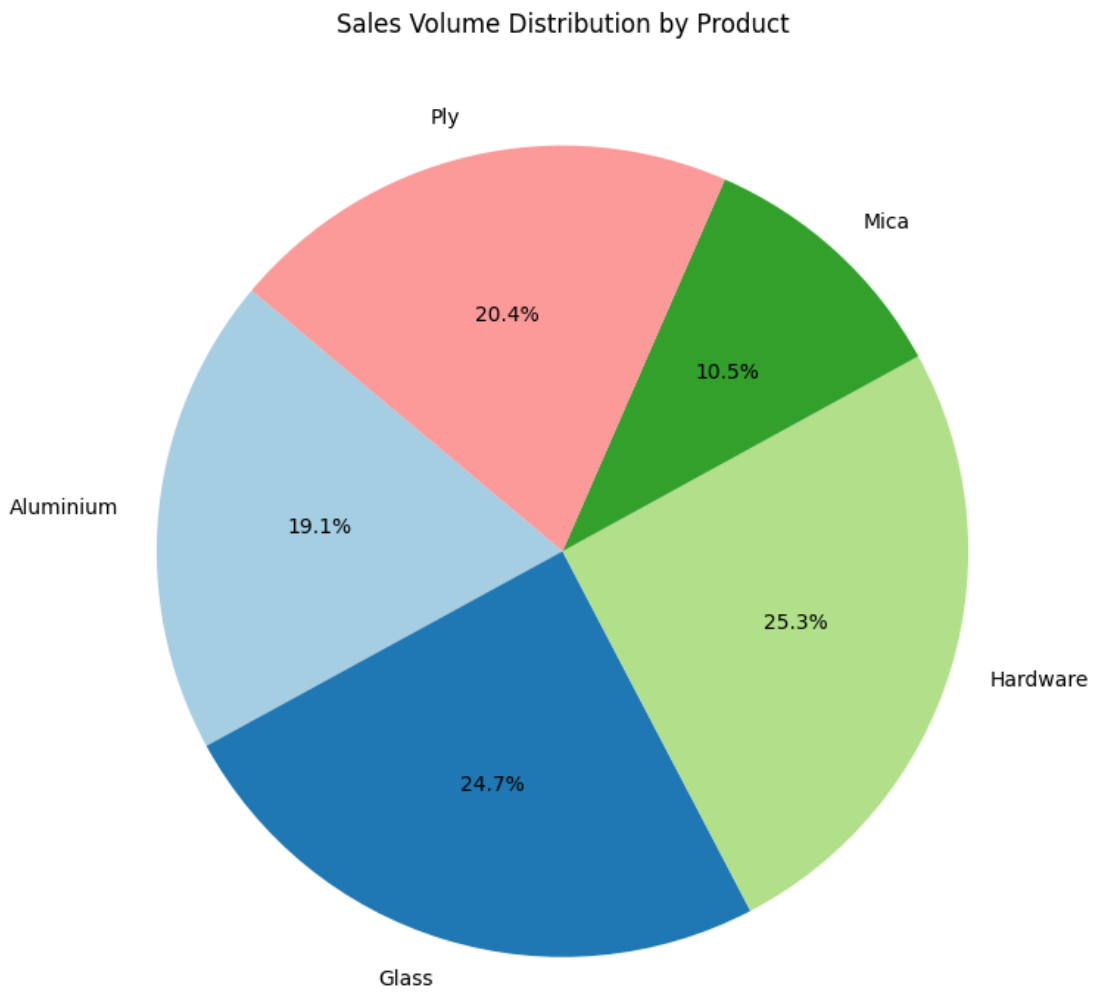
- Another significant drop(week 19): Around week 19,sales drop sharply again, reaching low point similar to week 7.
- Final decline(week 20-24): sales recover briefly but then decline again in following weeks, settling in lower range around 2000 units by week 24.

Key Finding

- Two major drop: there is two major drop in sales at week 7& 19, showing potential external factors affecting sales during these periods.
- Recovering periods: after each drop ,sales recover to its bound.
- Volatility: Sales show a lot of fluctuation, indicating demand or possible market challenges.
- Recent decline: Toward the end of period, there is gradual decline, which could be signal a longer-term issue affecting sales.

Currently, most frequent B2B business shop is handling is related to construction of flyovers near town. Hence speed of contruction work affects sales volume of shop and cause more fluctuation in trends of sales volume. Addition of more customers in market increase competition in business. Lack of proper adjustment in time leads to decrease in sales volume.

Sales volume descriptive analysis:



Observation:

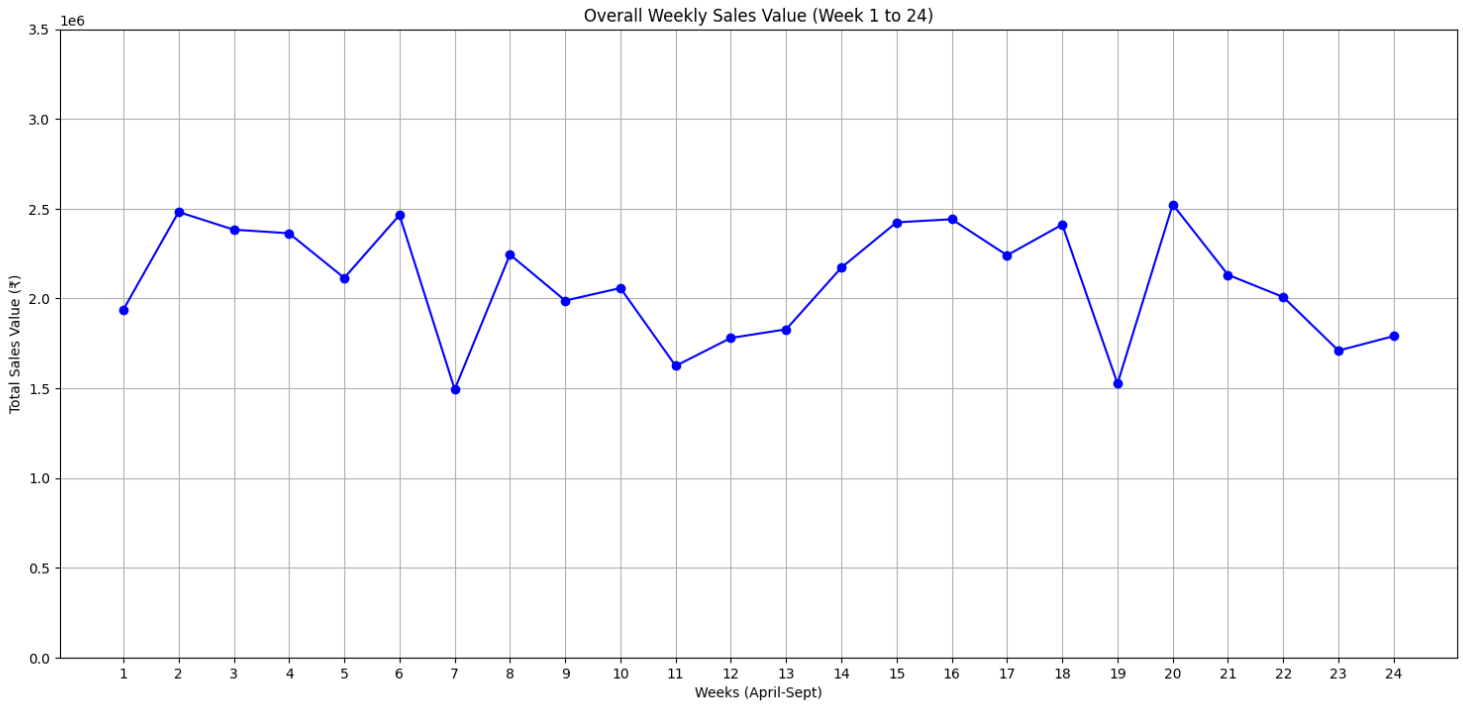
- Hardware(25.3%): This is the largest portion of pie, meaning hardware products make up highest percent of sales. Hardware includes lock, screws, doors and door skin etc. It accounts for a quarter of all sales.
- Glass(24.7%): Glass products are the second largest contributor to sales, almost equal to hardware. Together hardware and glass make up nearly half of all sales during period of april-september,2024.
- Ply(20.4%): Ply product hold the third largest share. They make up about one fifth of the total sales.
- Aluminium(19.1%): Aluminium products contribute nearly same share as ply, just under one-fifth of total sales.

- Mica(10.5%): Mica products have the smallest share, representing a little over one-tenth of total sales.

Key finding:

- Hardware and glass dominate: These two products categories together make up amount 50% of sales during these last 6 months, meaning they are the most important products for the business.
- Mica has least share: Mica is least sold product, accounting for just 10.5% of the sales. This might indicate lower demand or less focus on selling mica products.
- Balanced sales for Aluminium and Ply : Both ply and aluminium have relatively similar sales volumes, each contributing around 20% of total, showing that they are important but not primary focus like hardware and glass.

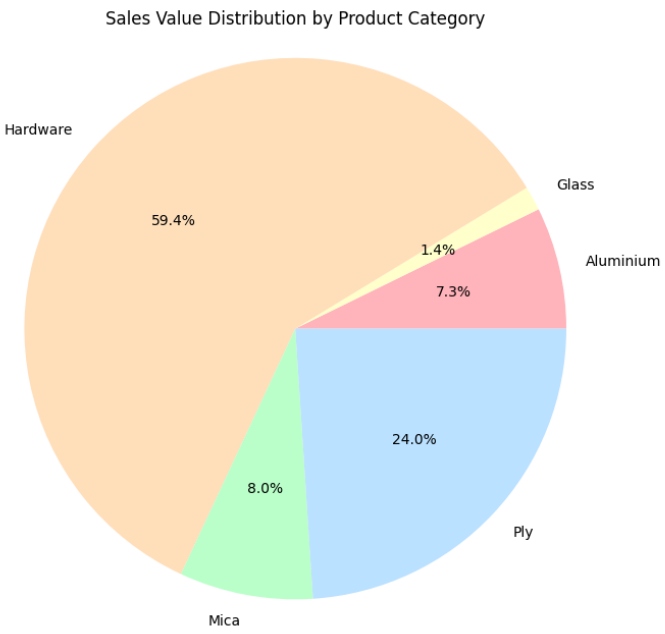
Sales value trend analysis:



Observation:

- Consistence start(week 1-6): The sales value starts off very stable, with ranging between ₹2.0 million and ₹2.5 million, for first few weeks.
- Sudden drop(week 7): There is a sharp decrease in sales during week 7,where sales revenue drop around ₹1.5 million.
- Quick recovery(week 8-9): Following the drop, sales quickly recover over week 8 and 9 reaching approving ₹2 million again in Week 9.
- Gradual Decline (week 10-12): After week 9 sales starts decreasing over next few weeks, bottoming out again around ₹1.75 million in Week 12.
- Growth surge(week 13-17): from week 13, there is gradual rise in sales, ₹2.75 million in Week 17, showing a significant recovery.
- Another significant drop(week 19): Around week 19, mirroring the earlier dip in Week 7, falling below ₹1.5 million.
- Final decline(week 20-24): Sales recover slightly after Week 19 but then enter a gradual decline again towards Week 24, settling around ₹1.6 million.

Sales value Descriptive analysis:



Observation:

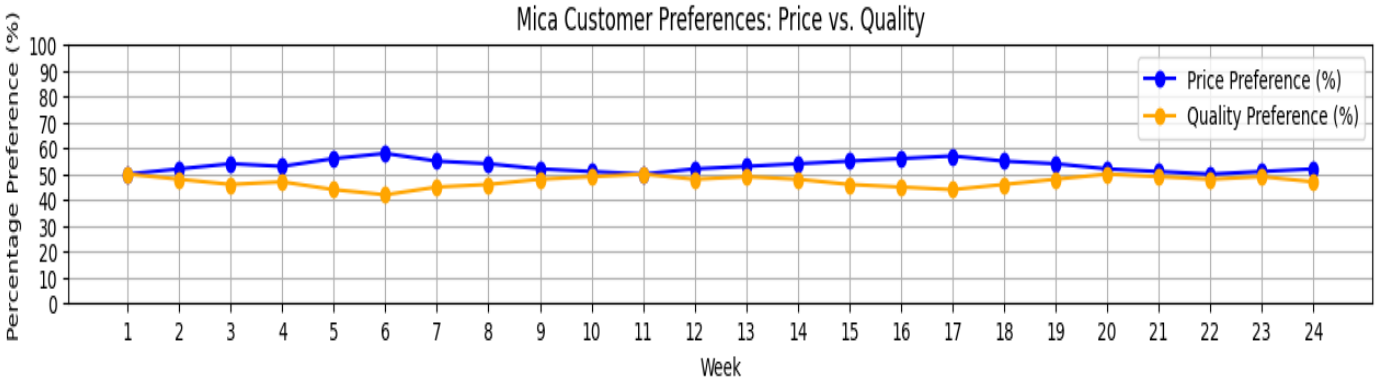
- Hardware Dominates(59.4%): The biggest share of revenue comes from hardware products. This means more than half of all revenue come from this category.
- Ply is Significant(24%): Ply accounts for 24% of revenue, making it the second largest contributor to the sales value.
- Mica's moderate share(8%): Mica products represent 8% of revenue, a smaller but still important portion.
- Aluminium's small contribution(7.3%): Aluminium products make up 7.3% of revenue, showing limited but still have demand in market.
- Minimal sales from glass(1.4%): Glass has smallest share at 1.4%, indicating that this product category contributes very little to overall sales value.

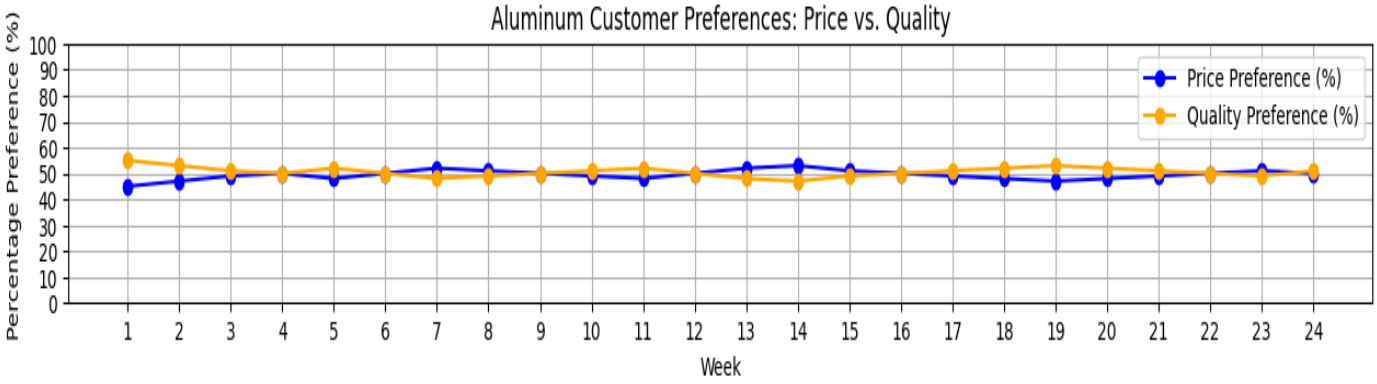
Key Finding:

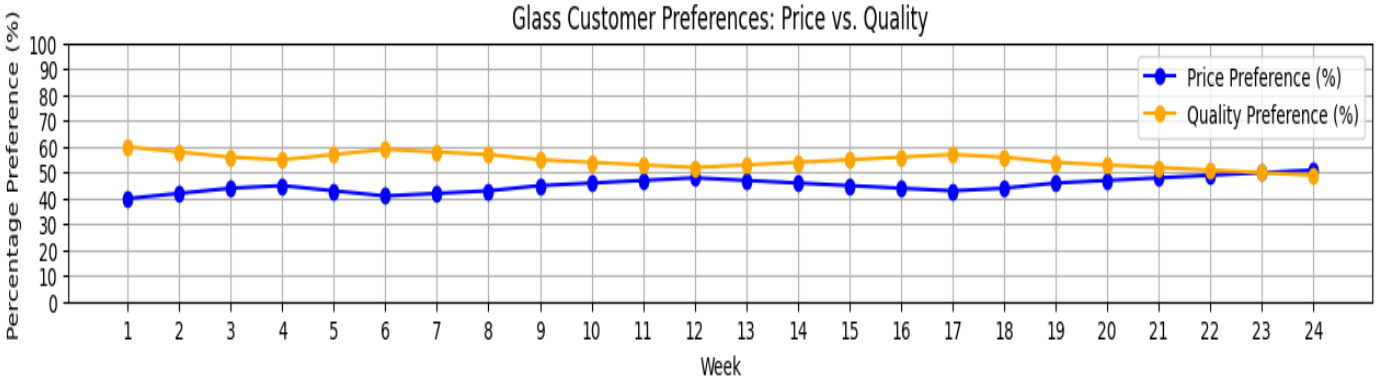
- Hardware dominant: Hardware is the biggest revenue contributor by far.

- Ply contributes a large chunk in revenue.
- Mica and Aluminium are smaller contributor of revenue.
- Glass products accounts a very tiny portion of total value.

Price and Preferences of customers:







Observation:

- **Mica Customer preference:**
  - Price preference Dominates: Throughout the 24 weeks, price is consistently more important than quality, with around 60-65% of customers prioritizing price over quality(which hover around 35-40%).
  - Steady trend: The preferences remain stable, with only slight fluctuations over time, showing that Mica customers generally stick to their price focused preference.
- **Aluminium customer preference:**
  - No particular preference: Both price and Quality is prefered in case of aluminum.
  - No Consistency: The trend is changing consistently, no certain relation on prioritizing between price and quality.
- **Glass customer preference:**
  - Quality is preferred: In glass category, quality is the dominant preference, with around 50-60% of customers prioritizing quality over price(40-50%).
  - Slight variations: The preference for quality is shifted from prioritizing quality to price because of belief that any quality glass is useless after little scratch or broke with minimal force.

Key finding:

- Mica: Customers are more focused on price, showing that they prioritize cost savings over quality. This is an important factor to consider when setting prices and marketing mica products.
- Aluminium: Quality and price both prefered. Aluminum serves wide range of products, certain products required high quality materials while many allows flexibilty in quality of materials. Such fexibility allows customers to have to flexible in their preference for cost as well as quality.
- Glass: Similar to aluminium, customers are more inclined toward quality, indicating that the shop can focus on promoting the premium aspects of its glass products to attract and retain quality-conscious customers.

4. Interpretation of Result and Recommendation

4.1. Recommendation 1: Increase Rate of Glass

From comparing descriptive analysis it is concluded that most sales volume produce few parts in sales value of total transactions in shop.

Minor points to Keep in mind during adapting this:-

- **Reason for increasing price:** Glass might be a high-volume seller, but if it is not contributing much to the shop's overall sales value, the pricing may not reflect its true worth. By slightly increasing price, it can ensure that it contributes more to the shop's profitability.
- **Balance Pricing Strategy:** Instead of a drastic price hike, gradually raising the prices or introducing different types of glass (e.g., basic, premium) at different price points to attract both budget-conscious and quality-focused customers.
- **Highlight Value**: You can also highlight the features of the glass (e.g., better durability, UV protection, scratch resistance) to justify the price increase to customers.

4.2. Recommendation 2: Services Free of Cost

- **Services free of cost for initial 3-4 months :** (like installation, delivery, or repairs) could help attract more customers, especially if they feel like they're getting extra value without paying more. However, make sure to manage this carefully so it doesn't eat into shop profits.
- **Strategic Free Services:** Don't have to offer free services for everything. Shop could reserve these offers for high-value products or bulk purchases to make it more sustainable.

4.3. Recommendation 3: Educate Customers

- **Demonstrate the Advantages of Quality**: Frequently, buyers are unaware of the extended worth of better-quality goods. For example, describing how higher-

quality glass can save energy by being safer, more durable, or offering superior insulation.

- **Make Use of Comparisons** To demonstrate the variations in quality, longevity, and performance, present side-by-side comparisons of the more expensive and more high-end products. Customers will find it simpler to comprehend why a higher charge is appropriate as a result.
- **Provide Rewards for Expensive Goods**: Give consumers one more incentive to select better-quality products. If customers choose a premium product, for example, provide a longer warranty, free installation, or future purchases at a discount.

4.4. Recommendation 4: Tiered Pricing

- **Multiple Price Points for Varying Budgets**: Shop may attract customers with both high and low budgets by implementing tiered pricing. For instance, charge more for premium glass that has cutting-edge features (such heat insulation or soundproofing) than shop would for conventional glass.
- **Perceived Value**: Customers have more options and control over what they buy because to tiered pricing. It also enables shop to charge luxury products more without offending buyers on a tight budget.

Additional Recommendation:

- **Focus on What Sells**: During busy seasons, stock up on high-demand, lower-cost items. But still keep quality options available for those who want them.
- **Seasonal Discounts**: Run special promotions during slower periods to keep sales steady.

5. Conclusion:

Ohm Sai Aluminium House faced significant challenges in balancing product quality with customer demand for lower prices. The business struggled with fluctuating revenue due to seasonal changes and a lack of customer understanding about the value of high-quality materials. Additionally, competition in the market made it difficult for the shop to stand out, especially when customers prioritized cost over quality.

The data analysis revealed that despite stable sales volumes, the shop's profitability was affected by customers' preference for cheaper products. By addressing these issues through targeted strategies, such as implementing tiered pricing, educating customers on the benefits of quality, and offering free services to enhance customer satisfaction, the shop can expect to see improved outcomes.

Looking ahead, **Ohm Sai Aluminium House** can anticipate:

- **Improved profitability**, thanks to better pricing strategies that cater to different customer segments.
- **Higher customer satisfaction** through value-added services and clear communication about product benefits.
- **More stable revenue** by managing seasonal fluctuations with strategic promotions and stocking.
- **A broader customer base**, serving both budget-conscious customers and those seeking premium products.
- **Stronger market positioning**, distinguishing itself from competitors by maintaining a reputation for quality and reliability.

In conclusion, by adapting its business model and focusing on both price-sensitive and quality-driven customers, **Ohm Sai Aluminium House** is expected to experience sustainable growth, greater profitability, and a stronger market presence while upholding its core values of quality and customer satisfaction.