Organization Background

I am working with the company named Mullick Filling Station which is a well-established dealership business under Hindustan Petroleum, specializing in the retail sales of petrol, diesel, and power fuels located at State highway-6, Benipur, Tribeni, Hooghly, West Bengal. Established on April 22nd, 1965, by Lt. Hazi Zalolath Hussain Mullick, it initially specialized in retailing petrol and diesel. With time, the company expanded its product line to include power fuel. Over the years, Mullick Filling Station underwent significant transitions. After the passing of Hazi Zalolath, Lt. Mohammed Rufikul Alam, his son, became a pivotal partner. Subsequently, partnerships shifted, with Rufikul Alam collaborating with his cousin, Lt. Noor Alam Mullick, before forming a partnership with his wife, Lt. Jibannesa Mullick, in 1980. In 1996, Mohammed Zulfiquar Ali Mullick, Rufikul Alam's son, assumed control of the business, initially partnering with his father in a 70:30 ownership split. Following Rufikul Alam's demise in 2014, Zulfiquar Ali Mullick continued as the sole proprietor until December 6th, 2019. After December 6th, 2019 he welcomed his wife, Mrs. Foujyaiftakari Mullick, as a partner, maintaining a 70:30 ownership structure till now.

Problem Statement (Listed as objectives)

Problem statement 1: To increase the amount of sales of power fuels with relative to sales of petrol fuels.

Problem statement 2: To reduce the problem of unnecessary leaves of workers or less number of workers.

Problem statement 3: To ensure maximum availability of workers during days of the week which contributes more to the sales by some demand driven strategies.

Background of the Problem

The first major problem the business is facing is related to lesser amount of sales of power fuels relative to sales of petrol fuels even if power fuels are much better in terms of quality than petrol fuels. The price of petrol in this petrol pump is Rs. 106.43/L whereas the price of power is Rs. 113.57/L. Due to this Rs. 7/L difference in price people are more likely to compromise quality and tend to buy petrol fuels as it is cheaper than power fuels. The business did start to sell turbojet (better quality fuel than diesel) a long years ago. Again due to high price of turbojet, vehicles availing diesel did not opt for turbojet at all. So the business had to stop selling turbojet fuels and then it started selling power. Now in case of vehicles

availing petrol some customers are also opting for power fuels. Now the business doesn't want to take harsh decision of stopping sales of power which might affect company's profit and hence wants to increase sales of power. The second major business issue that the organization is facing is related to less availability of number of workers or rather uncertain leave of workers. This might be due to the fact that workers are less paid compared to amount of work done. According to the business owner, the monthly wage for a new worker is Rs. 6000 for working 8 hours a day and Rs. 8000 for working 12 hours a day. The monthly wage is too low compared to duration of duty hours and the business owner might not be willing to pay more than that. Due to this fact workers tend to take uncertain leaves from their work or permanently leave the job. For this reason, sometimes it results in a backlog of customers at the petrol pump. Consequently, the time taken to serve each customer increases, leading to instances where other customers opt for other petrol pumps due to extended wait times.

Data collection

As my project title states "Revitalize & Thrive: Elevating sales and service through demand driven strategies" I therefore consider helping in elevating sales and service of the business through demand driven strategies. For this reason, I collected the sales data of petrol, diesel and power fuels for the period of 6 months i.e. from 1st April, 2023 to 30th September, 2023 in order to analyze the market demand. The sales data of three fuels which was collected is measured in litres(L). Then the data was preprocessed in excel and various other columns were determined such as weekdays, month, total sales of fuel on daily basis. The price of petrol in this petrol pump is Rs. 106.43/L, the price of power is Rs. 113.57/L and price of diesel is Rs. 93.14/L. From this information, revenue earned (in Rs.) by sales of each fuel type is calculated on daily basis. And lastly, total revenue earned (in Rs.) is calculated by summing up revenues earned by sales of each fuel. The metadata is provided below in details:

Data 1:

Data collected:- Sales data of petrol, diesel and power fuels

Source:- Sales record obtained from the petrol pump(concerned business organization)

Period for which data is collected:- 6 months i.e. from 1st April, 2023 to 30th September, 2023

Data 2:

Data collected:- Survey data on customer buying power/petrol (for market research)

Source:- Collected by me and the business organization collectively

Period for which data is collected:- On 25th July from 11:00 a.m. to 10p.m (the period of time when sales of fuel is high in a day)

Data attributes:- 2 variables for keeping count of people buying power and people buying petrol.

Detailed Explanation of Analysis process/method

i) Analysis of sales data:

a) Data Collection

The project titled "Revitalize & Thrive: Elevating Sales and Service through Demand-Driven Strategies" aims to analyse and enhance the sales performance of a petrol pump through strategic data-driven decisions. The sales data for petrol, power, and diesel fuels was collected over a 6-month period, from April 1, 2023, to September 30, 2023. The owner of the organization agreed to share this valuable data, which was initially recorded daily in a physical record book at the petrol pump.

To facilitate the analysis, I manually transcribed the daily sales data from the record book into an Excel file. This digitized format allowed for easier handling, manipulation, and analysis of the data, providing a solid foundation for further investigation into sales trends and patterns.

b) Data Selection, Preprocessing, and Cleaning

After the initial data collection, it was essential to preprocess and clean the data to ensure accuracy and reliability in the analysis. The data collected included the date, sales of petrol, sales of power, and sales of diesel, recorded daily.

Additional Columns Determined:

- **Weekdays and Month:** These columns were derived from the date information, helping to analyze sales trends across different days of the week and months.
- **Total Sales of Fuel:** This column was calculated as the sum of the daily sales of petrol, power, and diesel.
- **Revenue Calculation for each fuel type and total revenue earned:** Using the provided prices:- ₹106.43/L for petrol, ₹113.57/L for power, and ₹93.14/L for diesel, I calculated the daily revenue earned from each fuel type. The total daily revenue was then obtained by summing up the revenues from all three fuel types.

c) Data Analysis

Data Visualization

- Visual representations such as **bar charts**, **line graphs**, and **pie charts** were used to display sales and revenue data.
    - **Bar Charts:** To compare average daily sales across different fuel types.
    - **Line Charts:** To show monthly trends in total sales and individual fuel sales.
    - **Pie Charts:** To illustrate the percentage contribution of each fuel type to total revenue.

Identification of Patterns

- **Average Daily Sales Comparison:** Examined differences in the daily sales volume of petrol, power, and diesel to identify which fuel was most and least sold.
- **Monthly Trends:**
    - Observed sales fluctuations across months to detect peaks (e.g., July's increase due to elections) and dips (e.g., August's decrease due to competition).
    - Correlation analysis was used to explore the relationship between sales of petrol and power fuels.
- **Weekday Trends:**
    - Analyzed sales and revenue data by weekdays to pinpoint days of high and low sales volume.

- Noted cultural and operational factors which can affect sales of fuels (e.g., Thursday's dip due to closed shops and superstitions).

ii) <u>Market research by help of surveys:</u>

Market research was conducted on sales of petrol and power fuels on 25th July from 11:00 a.m. to 10p.m (the period of time when sales of fuel is high in a day) which helped me determine customer's point of view. In total 167 customers were surveyed who opted for power/petrol fuel. From total 167 customers, 138 customers opted for petrol fuel and 29 customers opted for power fuel. To the customers who opted for petrol were asked why they don't prefer power provided its better quality. On reply to that, every customer told the same that due to high fuel prices, they are not ready to pay extra Rs. 7/L to buy power and are satisfied with petrol fuels. To the customers who opted for power were asked why they prefer power over petrol. On reply to that, every customer told the same that due to high quality of power fuel, the mileage given by vehicle is much better and hence experience better performance. They were also asked whether they would revert to use petrol again in future or not. On reply to that, they told that they would never do so if price difference between petrol and power doesn't differ much. This helped me assert the fact that power fuel customers are loyal and hence there is a scope for increasing sales of power fuels by targeting new customers.

Results and Findings

1. Average sales of fuels on daily basis

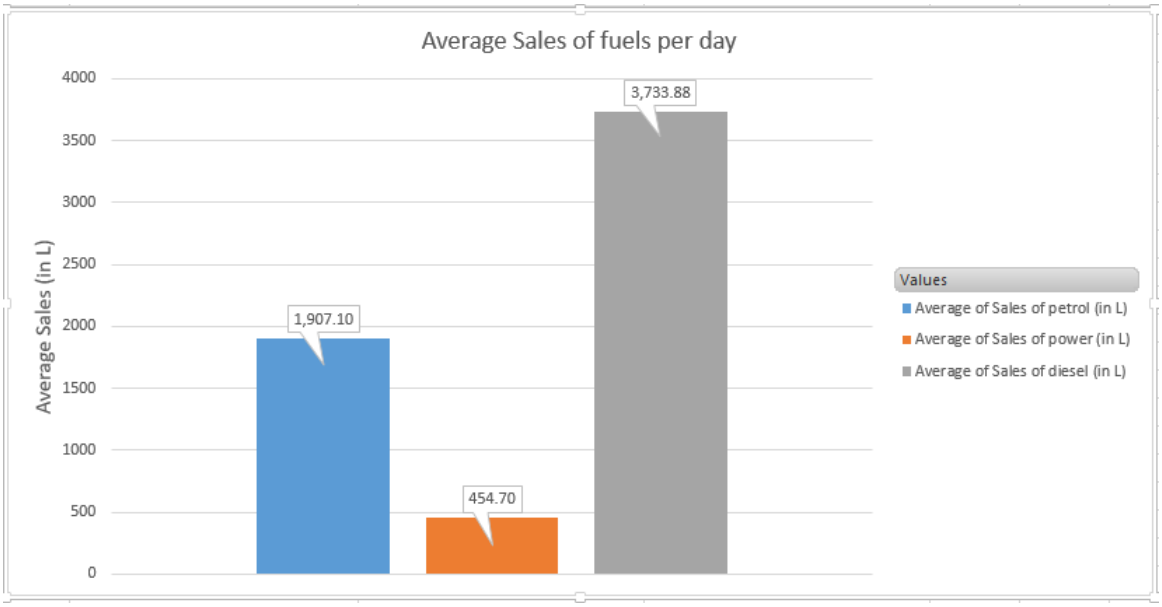

Figure 1: Average sales of fuels on daily basis

The above bar chart in Figure 1 shows the comparison between the average daily sales of petrol, power and diesel fuels in litres. Here we see that the power fuel is the least sold fuel and diesel fuel being the highest sold fuel. The average daily sales of diesel fuel is highest due to the obvious fact that there are 3 factories located nearby thus heavy vehicles creates the demand. For lighter vehicles and motorcycles, customers prefer petrol over power due its lower price than power. We can also observe that the average daily sales of petrol is about 4.2(near about 4) times the average daily sales of power and additionally the average daily sales of diesel is about 1.9(near about 2) times the average daily sales of petrol.

2. Percentage Contribution of Each Fuel Type to Total Revenue Earned

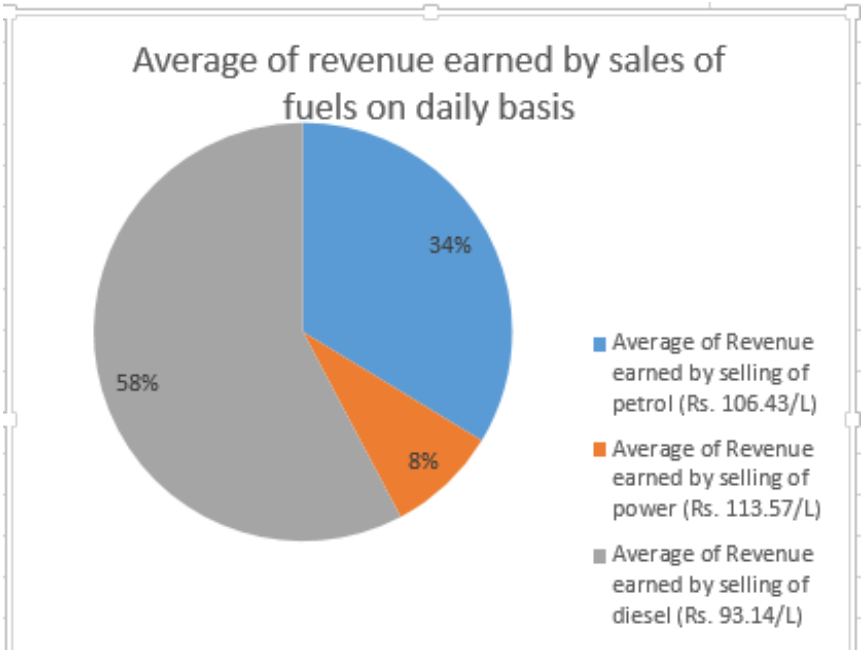

Figure 2: Percentage contribution of each fuel type to total revenue earned

The figure above illustrates the percentage contribution of each fuel type to the average total daily revenue. Diesel emerges as the highest contributor, accounting for 58% of the average daily revenue, approximately Rs.3,47,773.56. Petrol follows, contributing 34% of the average daily revenue, approximately Rs.2,02,973.06. Power fuel contributes the least, making up 8% of the average daily revenue, approximately Rs.51,640.22. Thus diesel and petrol contributes 92% of the daily average revenue and hence stock out of any of these products can cause huge loss in a single day. Thus the organization must ensure that efficient stock is available in each day.

3. Market Research on customers

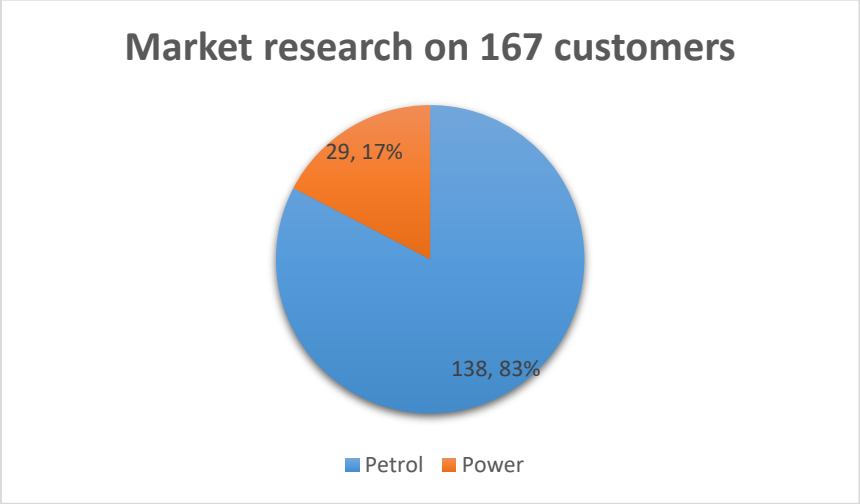

Figure 3: Market research results done on 167 customers who came to buy petrol/power fuels

As discussed earlier, a market research was conducted on customers of petrol/power fuels on 25th July from 11:00 a.m. to 10p.m (the period of time when sales of fuel is high in a day). Total of 167 customers opted to buy petrol/power fuels. The above pie chart in Figure 5 shows that out of total 167 customers, 138 customers opted for petrol fuel and 29 customers opted for power fuel. So about 17% customers prefer power fuels which is highly in correspondence with the average daily sales of power which is about 19% of the total petrol and power fuels sold.

4. Trend of total sales of petrol and power on monthly basis

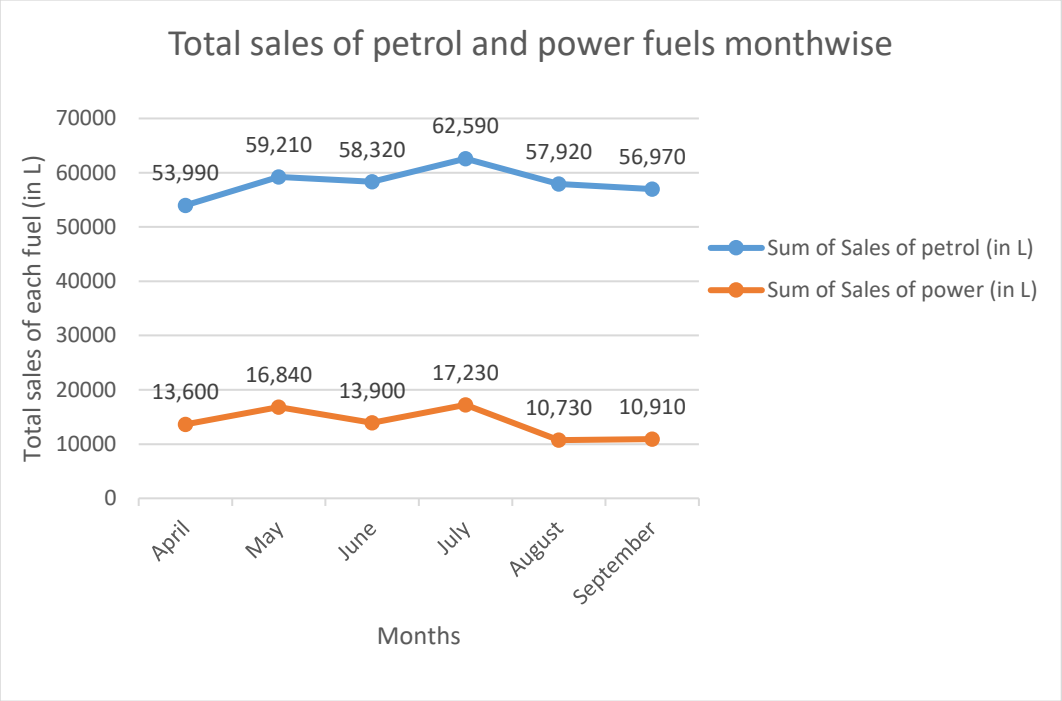

Figure 4: Trend of total sales of petrol and power on monthly basis

The above line chart in Figure 3 shows the trend of total sales of petrol and power on monthly basis. We observe that there is not too much deviation of changes in sales of power fuels with respect to sales of petrol fuels. Briefly, it means that when sales of petrol is increasing, correspondingly sales of power is also increasing and vice versa. Though there is no correlation between daily sales of petrol and power but there is a moderate correlation between total sales of power and petrol month wise with correlation coefficient value near 0.6. If price of the fuel had been the dominant factor which can affect sales of power then the sales of power would have decreased over months but it is not so in this case. This also asserts the fact that power fuel customers are loyal which was stated earlier while conducting market research.

Keeping in mind of these facts, the business organization need to focus more on spreading awareness program among customers related to power fuel and its essence of its quality in order to increase its sale and thus maximize revenue. Normal petrol has an octane rating within the range of 85 to 87. Power petrol's octane rating is within the range of 91 to 94. Power petrol octane number is higher, which helps to reduce engine-knocking and detonation. This leads to better combustion. High octane petrol also helps the engine to work at full capacity and leads to better fuel efficiency.

5. Trend of average of sales of fuels and total sales of all fuels on monthly basis

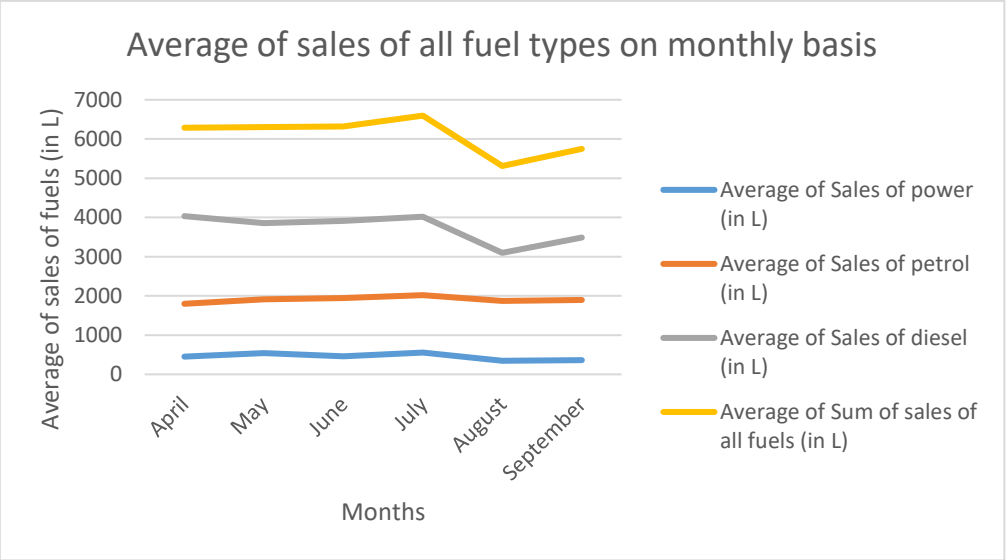

Figure 5: Trend of average of sales of fuels and total sales of all fuels on monthly basis

The figure above illustrates the monthly trend in the average sales of each fuel type (petrol, power, and diesel) as well as the total sales of all fuels combined.

From April to June, average sales across all fuel types remained relatively consistent. However, there was a notable increase in total fuel sales in July, largely due to the nearby panchayat elections. Increased traffic from commercial vehicles involved in election activities contributed to this spike in demand.

In August, we observe a significant decline in total fuel sales. This drop was attributed to a newly opened Reliance petrol station located about 40 kilometers away, offering fuel at a lower price. Many commercial vehicles, especially those on long-distance routes, opted to refuel at the Reliance station instead.

In September, the average sales of fuels began to recover. Lower prices became less feasible as fuel availability declined, leading to the need for imports. Consequently, sales at this station improved as prices stabilized.

6. Average revenue earned on weekdays basis

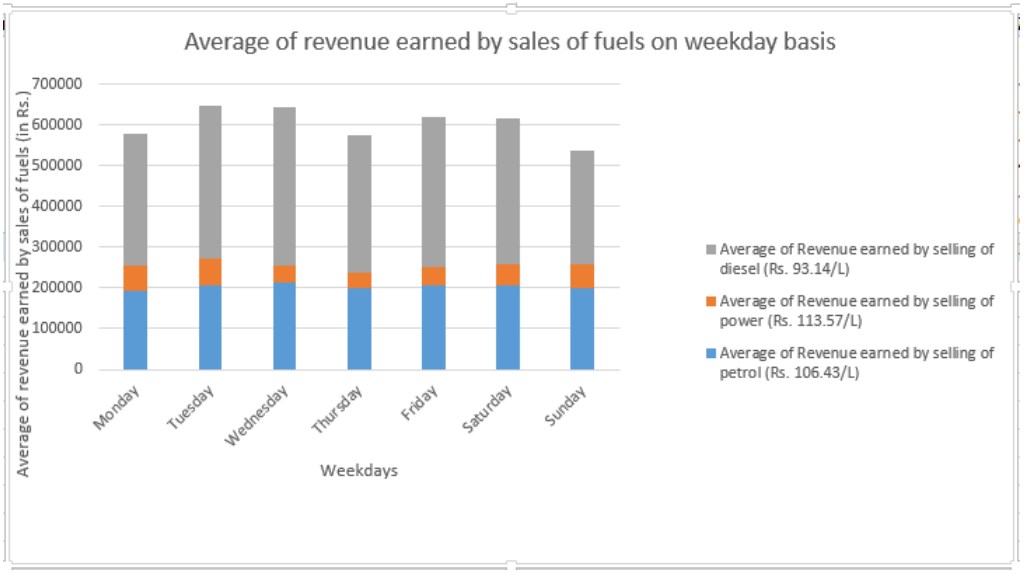

Figure 6: Average revenue earned by sales of fuels on weekdays basis

The figure above depicts the average revenue earned from fuel sales across weekdays. The total revenue from all fuel sales shows an increasing trend from Monday to Tuesday, remaining relatively steady through Wednesday. However, there is a noticeable dip in revenue on Thursdays due to a decline in fuel sales. This drop can be attributed to two main factors. First, most shops in the locality remain closed on Thursdays, resulting in reduced vehicle traffic near the petrol pump. Second, many people consider Thursday as "Laxmi Day" and follow a superstition that discourages going out on this day.

On weekends, particularly Sundays, diesel sales decrease significantly because the majority of commercial vehicle drivers take leave. Conversely, sales of power fuel (branded fuel) increase substantially on Sundays, as families often plan trips and prefer power fuel over petrol due to its superior performance. If customers are deterred by the higher price of power, they tend to opt for petrol instead, which helps maintain relatively stable petrol sales over the weekend.

Interpretation of Results and Recommendation

The analysis provides several insights into the sales trends of different fuels and factors affecting these trends, summarized as follows:

1. Fuel-Specific Trends

- **Diesel:** Diesel contributes the most to revenue (58%), with average daily sales driven by heavy vehicle demand due to the presence of nearby factories. Its sales decrease on Sundays due to leaves taken by commercial vehicle drivers.
- **Petrol:** Petrol accounts for 34% of daily revenue, with stable sales across the week. Its lower price makes it more attractive for light vehicles and motorcycles compared to power fuel.
- **Power Fuel:** Power fuel contributes only 8% to revenue, with sales being the lowest among the three fuels. However, its loyal customer base and the preference due to its efficiency for trips on Sundays indicate potential for growth.

2. Weekly and Monthly Trends

- **Weekdays:** Revenue generally increases from Monday to Wednesday, but dips on Thursdays due to reduced vehicle traffic and superstitions about "Laxmi Day." On Sundays, power fuel sales increase while diesel sales decline.
- **Monthly:** Total fuel sales peaked in July due to election-related activities and dipped in August because of competition from a nearby Reliance petrol pump offering cheaper prices. Sales recovered in September as competition stabilized and fuel availability decreased, necessitating imports.

3. Customer Behavior

- **Market Research:** 17% of surveyed customers preferred power fuel, reflecting its steady yet limited demand. This aligns with the observation that power fuel customers are loyal, unaffected significantly by price fluctuations.
- **Performance Focus:** Power fuel customers value its higher quality (high octane rating), which improves engine performance and fuel efficiency.

Recommendations

1. Strategies to Boost Power Fuel Sales

- **Awareness Campaigns:**
    - Conduct marketing campaigns to educate customers on the benefits of power fuel, emphasizing its higher octane rating, superior combustion, and engine efficiency.
    - Offer promotional discounts or loyalty rewards for power fuel customers to attract and retain more buyers.
- **Targeted Marketing:**
    - Focus advertisements on families and car owners, highlighting power fuel's reliability for long trips.
- **Cross-Selling Opportunities:**
    - Bundle power fuel purchases with services like discounted accessories, checking of tire pressure, incentivizing customers to switch.

2. Workforce Management

- **Demand-Based Scheduling:**
    - Use weekday sales data to ensure adequate staffing during high-demand days. According to the data given, the weekdays Monday, Tuesday, Wednesday and Friday have high sales of fuels and hence must ensure enough workers are available in these days.
    - Offer incentives for workers to avoid taking unnecessary leaves on Sundays, ensuring smooth operations.
- **Flexibility and Retention:**
    - Introduce flexible work shifts for employees, especially on low-demand days like Thursdays, to maintain morale while reducing idle time.
    - Implement an attendance reward system to reduce absenteeism, particularly on weekends when power fuel sales peak.
    - If necessary, the monthly wage provided to workers must be reviewed again to ensure enough motivation for workers to work.

3. Competitive Pricing and Service Improvement

- **Monitor Competitor Prices:**
    - Keep track of nearby petrol pump pricing strategies, particularly competitors like Reliance, and adjust marketing efforts accordingly.

4. Monthly Trends Adaptation

- **Proactive Planning for Spikes:**
    - Anticipate demand spikes during events like elections or festivals, ensuring adequate fuel stock and worker availability.
- **Addressing Seasonal Dips:**
    - Compensate for low sales periods by running promotional offers or increasing outreach efforts during these times.