Efficiency-Driven Menu Optimization & Workforce Management of A2Z Food Court

A Final Submission for the BDM capstone Project

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Contents

Executive Summary

This project focuses on optimizing the operations and profitability of A2Z Food Court, a unit of A2Z Facility Management Services (A2Z FMS), located in Lucknow. Through a systematic and data-driven approach, the analysis aimed to identify opportunities for improving menu performance, aligning labor costs with demand, and enhancing overall business efficiency. Leveraging one year of comprehensive sales data provided by Mr. Pradeep Panwar, the visionary founder of A2Z FMS, the project employed advanced analytical tools such as Excel, Python, and statistical models to uncover actionable insights.

The analysis revealed clear seasonal trends, with revenue peaking in September (₹6,03,142.65) and declining sharply from October to December. This mid-year surge was attributed to festivals and vacations, while the year-end slump highlighted the need for targeted strategies like discounts or loyalty programs. Category-wise performance showed that high-revenue items like Veg Paneer Paratha and Special Thali (Category A) contributed 79.8% of total revenue while representing only 19.2% of the menu. In contrast, low-performing items in Category C accounted for 52.5% of the menu but contributed just 5.2% of revenue, indicating inefficiencies in resource allocation.

ABC and Pareto analyses emphasized the importance of focusing on high-margin products while addressing underperforming items. Recommendations included promoting Category B items like Samosa and Chili Paneer through bundled offers or targeted campaigns to diversify sales and reduce over-reliance on top-performing items. Seasonal innovations such as festive desserts or beverages were suggested to attract new customers and create excitement around the menu.

Labor cost optimization was another critical focus area. By analyzing monthly and weekly revenue patterns, it was recommended to align staffing levels with demand fluctuations. For high-revenue months like September, additional staff should be scheduled to handle increased footfall, while during slower months like January and February, shifts can be shortened or part-time workers employed to minimize costs without compromising service quality. Weekly trends further revealed that Sundays were the slowest day for sales, presenting an opportunity to reduce staff during non-peak-hours.

The correlation analysis provided additional insights into customer behavior by identifying strong relationships between sales quantities and revenue during specific quarters. For example, consistent performance in Apr-Jun24 and Jul-Sep24 highlighted predictable demand patterns that can be leveraged for inventory management and marketing strategies. However, weaker correlations in Oct-Dec23 suggested a need to refine promotional efforts during this period to drive both volume and profitability.

In conclusion, this project underscores the importance of data-driven decision-making in addressing business challenges and driving sustainable growth. By implementing these recommendations—optimizing menu offerings, aligning labor costs with demand patterns, leveraging predictive analytics for inventory management, and enhancing marketing strategies—A2Z Food Court can achieve long-term profitability while improving customer satisfaction. This comprehensive analysis not only addresses immediate operational needs but also lays a strong foundation for future strategic initiatives that align with evolving market dynamics.

Detailed Explanation of Analysis Process

The initiation of the analysis process for the project began with a conversation with Mr. Pradeep Panwar, the founder of A2Z Facility Management Services (A2Z FMS). During our discussion, Mr. Panwar shared that while the food court is not facing any specific operational challenges, there is a need to improve profitability. This insight provided the foundation for conducting an in-depth analysis aimed at identifying opportunities to optimize sales and enhance overall business performance.

Data Collection

Following our conversation, Mr. Panwar granted access to the Pet Pooja App, which serves as the primary data management system for A2Z Food Court. Using this platform, I retrieved one year's worth of data (October 2023–September 2024), including daily sales data and item-wise sales data. This dataset provided a comprehensive view of the food court's operations, covering revenue trends, product performance, and category-wise contributions.

Data Cleaning

The raw dataset was first cleaned using Excel to ensure its accuracy and reliability for analysis. Null values were replaced with appropriate substitutes, unnecessary columns were removed, and date formats were corrected to maintain consistency. This meticulous cleaning process ensured that the dataset was ready for further exploration.

Data Analysis

The cleaned dataset was imported into Jupyter Notebook, where Python was used to perform detailed exploratory data analysis (EDA). Various Python libraries such as Pandas, NumPy, Matplotlib, and Seaborn were utilized to uncover meaningful insights from the data. The key steps in the analysis process included:

1. **Daily Sales Trends:**
    - The daily sales data was analyzed to identify patterns in revenue generation over time. A 7-day rolling average was calculated to smooth short-term fluctuations and highlight overall trends.
2. **Category-Wise Analysis:**

- Items were grouped into categories such as Meals, Snacks, Beverages, Desserts, and Miscellaneous. Sales trends for each category were analyzed across four quarters to understand their performance over time.

3. **ABC Analysis:**
    - Items were classified into three categories (A, B, C) based on their contribution to total revenue using cumulative percentage thresholds. This helped prioritize high-revenue items while identifying low-performing ones that required intervention or elimination.
4. **Pareto Analysis:**
    - The Pareto principle was applied to determine that a small group of items contributed to the majority of revenue. This highlighted the importance of focusing on high-performing products while addressing inefficiencies in low-performing ones.
5. **Correlation Analysis:**
    - Correlation matrices were created to examine relationships between sales quantities and revenue across different quarters. This provided insights into seasonal demand patterns and helped identify periods requiring strategic adjustments.
6. **Labor Cost Optimization:**
    - Weekly and monthly sales patterns were analyzed to align staffing levels with demand fluctuations. Recommendations were made to optimize labor schedules during peak and off-peak periods.

Visualization

To enhance interpretability, various visualizations were created using Python libraries such as Matplotlib and Seaborn. Line graphs were used for trend analysis, pie charts for category contributions, bar charts for dealer-wise revenue insights, and heat maps for correlation analysis. These visuals provided a clear understanding of key patterns and trends in the data.

Conclusion

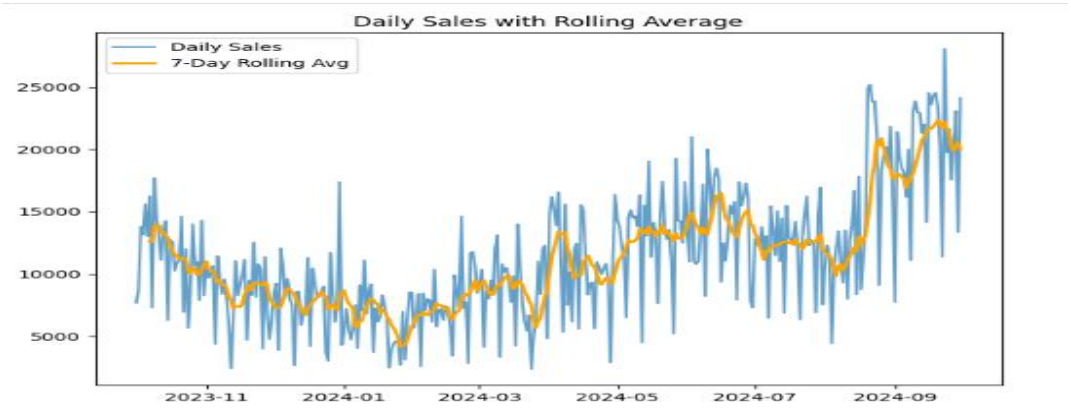
The analysis provided actionable insights for A2Z Food Court, enabling optimization of menu offerings, alignment of labor costs with demand, and strategic decisions to enhance profitability and operational efficiency.

Result & Findings

1.Trend Analysis

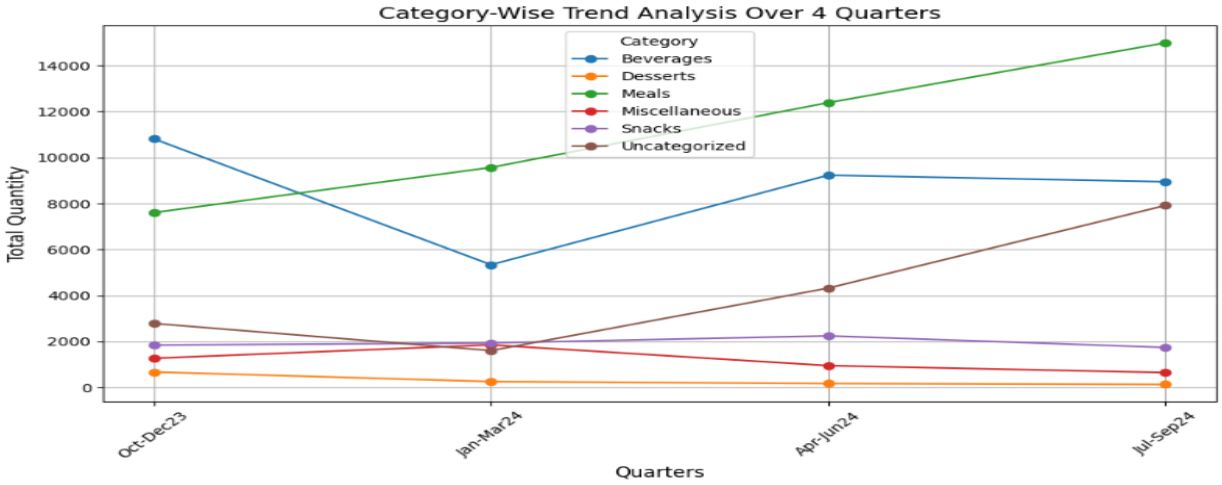
The sales data shows clear seasonal trends, with revenue increasing steadily from the start of the year and peaking in September. This suggests that demand is highest during the mid-year, likely due to festivals, vacations, or special occasions. However, after September, sales begin to decline sharply, reaching their lowest levels in the last few months of the year, particularly in October to December. This indicates a season period when fewer customers are spending.

The analysis also highlights the months with the highest and lowest sales. **September** recorded the highest revenue of **₹6,03,142.65**, followed by **August** and **June**, showing peak performance during these months. This confirms that mid-year is the busiest period for the Food Court. These months likely benefit from increased customer activity, making them crucial for maximizing sales through targeted promotions and efficient stock management



The daily sales graph, combined with the 7-day rolling average, reveals an overall upward trend in revenue throughout the year, even though there are short-term fluctuations. These ups and downs may be due to changes in customer behavior, such as lower footfall on weekdays or specific days.

The steady sales performance from March to July and the significant revenue peak in September highlight an important opportunity for the A2Z Food Court. By focusing on stocking high-demand items and offering promotions during these busy months, the Food Court can maximize its revenue potential. On the other hand, the slower months toward the year-end require targeted strategies like discounts, loyalty programs, or introducing new products to attract customers and boost sales.



The trend analysis for **A2Z Food Court** reveals significant insights into category-wise customer preferences over the four quarters. The consistent growth in the **Meals** category, which includes Special Thali, V. Dal Roti, V. Normal Thali, and more, highlights a rising demand for wholesome food options, likely driven by working professionals, families, or students. In contrast, **Beverages** and **Desserts**, including Energy Drinks, Gulaab Jamun, hot milk, and others, showed declining trends, suggesting seasonal demand or shifting preferences toward other categories. The decrease in **Snacks** and **Miscellaneous**, which include Biscuits, Veg Sandwich, Burger, and more, during the latter quarters indicates opportunities tied to festive seasons or promotional activities. Similarly, the fluctuating yet rising trend in the **Uncategorized** category, comprising items like Water Bottle, Roti, Chole Khasta, and others, calls for a deeper understanding of emerging customer preferences. These insights can guide strategic decisions, such as optimizing inventory for high-demand categories like **Meals**, introducing seasonal promotions for **Beverages** and **Desserts**, and enhancing the menu with innovative offerings across **Snacks**, **Miscellaneous**, and

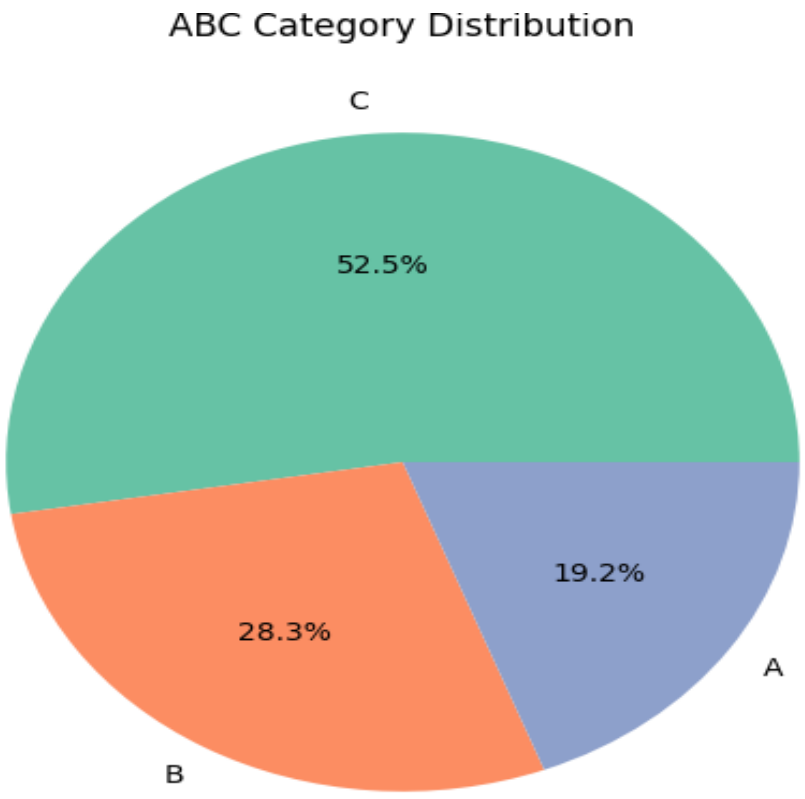
Uncategorized. By aligning marketing and operations with these patterns, **A2Z Food Court** can better meet customer needs and drive sustainable growth.

2. **SKU Segmentation Using ABC Analysis**

ABC analysis was conducted on the sales data of A2Z Food Court to classify items into three categories: A, B, and C, based on their contribution to total revenue and cumulative percentage share. The results provide clear insights into the performance of different products over the past year.

1. **Category A:** High-value items that dominate revenue generation.

- **Veg Paneer Paratha**: With **8,036 units sold**, this item contributed **₹918,434.44 to total revenue**, making it the top-performing product.
- **Special Thali:** With **10,638 units sold**, it generated **₹339,318.20 in revenue**, making it another major contributor.
- **Veg Fried Rice:** This item **sold 3,541 units**, contributing **₹183,587.86 to the revenue**. Collectively, Category A items account for **79.8% of total revenue**, while representing only **19.2% of the total items**, highlighting their significant impact on business success.



2. **Category B:** Medium-value items that provide moderate revenue.

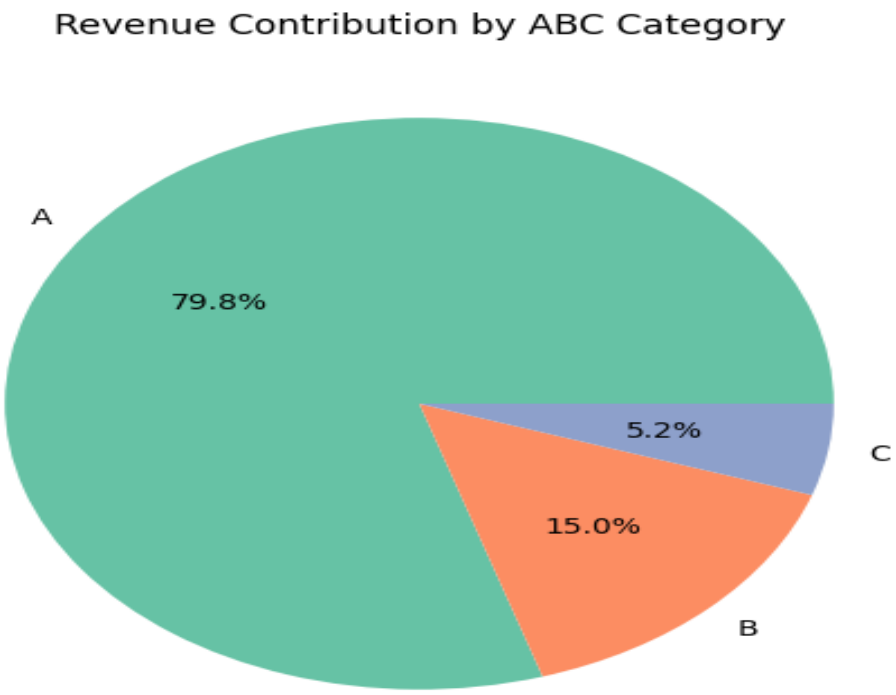
- **Samosa:** With 1200 units sold, this item falls in the medium-performance range.
- **Chili Paneer:** A slightly lower performer, selling **790 units**.

  Together, Category B items represent **28.3% of the total items** and contribute **15.0% to the revenue**, showing their importance in maintaining steady sales.

3. **Category C:** Low-value items with minimal revenue contribution.

- **V. Coffee, Energy Drink, and Maza:** These items sold only 4, 3, and 3 units, respectively, over the year.

  Despite comprising **52.5% of the total items**, Category C contributes just **5.2% of the total revenue**, making them the least valuable to the overall business performance.



The pie chart visually depicts the proportional share of each category in terms of items and revenue. It clearly shows the stark contrast between high-revenue Category A items and low-revenue Category C items.

3. Pareto Analysis

The Pareto analysis of A2Z Food Court's sales data reveals that a small group of items contributes to the majority of the revenue. For example, **Veg Paneer Paratha, Special Thali, Veg Fried Rice and some more** together generate a massive portion of the total revenue. Despite being only a few items, they account for **79.8% of the overall revenue**, showing their high importance in the menu.

On the other hand, items like **V. Coffee, Energy Drink, Maza and more** fall into the lower-performing group. These items contribute only **5.2% of the revenue**, even though they make up **52.5% of the total products sold**. This stark contrast highlights how a large number of products add little value to the total earnings.

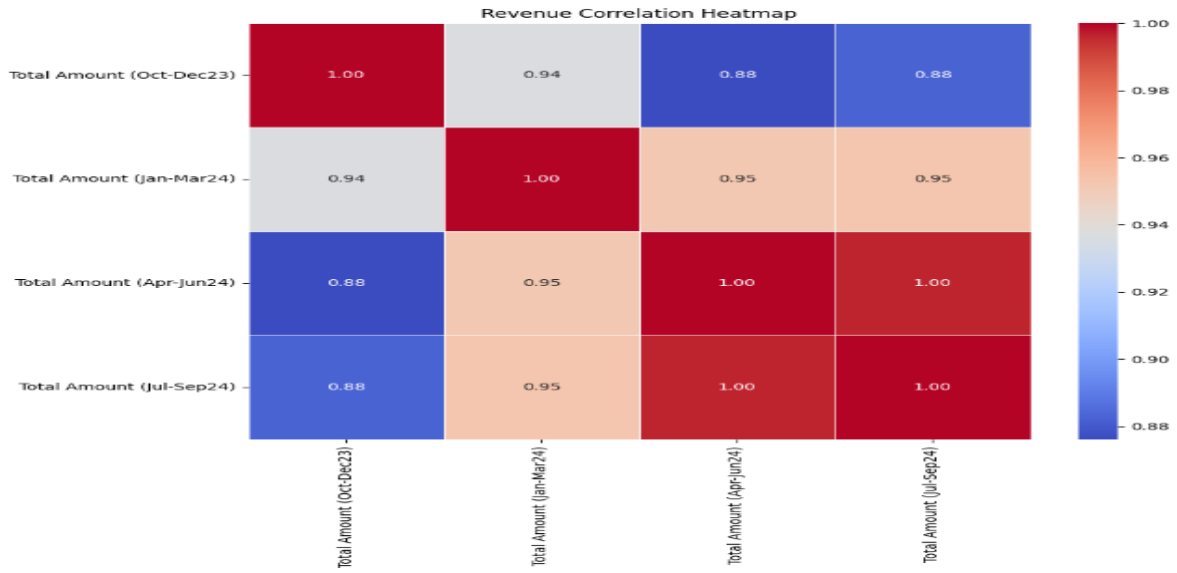
From this analysis, it's clear that the top-performing items are the key drivers of business success. Focusing on these items can help improve profits and customer satisfaction. At the same time, the low-performing items need to be reconsidered. The Food Court can either improve their performance through better promotion or remove them from the menu to avoid wasting resources.

This data-driven insight helps prioritize efforts and ensures that resources are invested where they matter the most.

4. Correlation Analysis

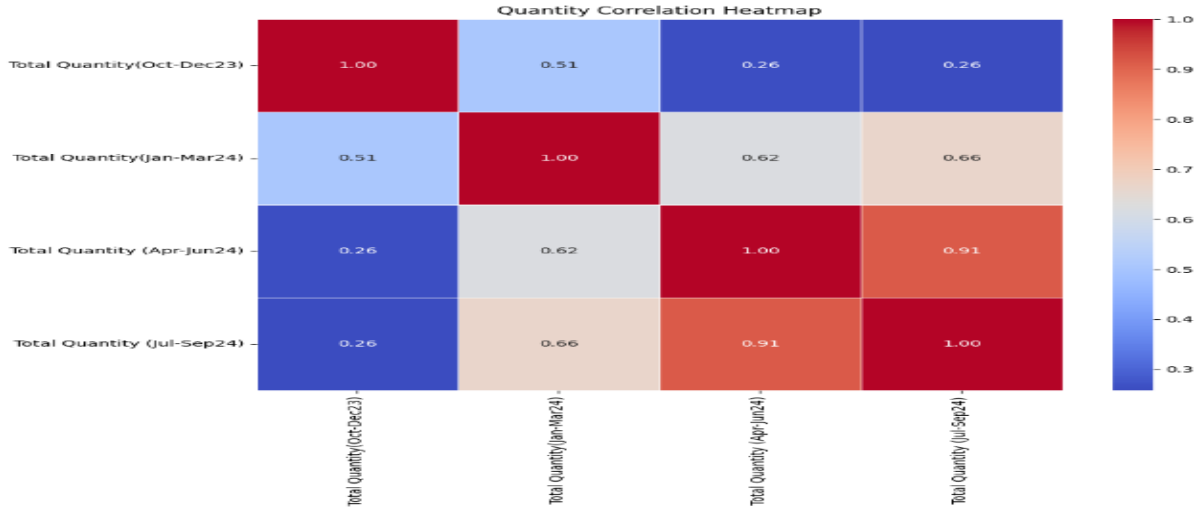
The correlation analysis for A2Z Food Court's sales and revenue data provides critical insights into how quantities sold relate to revenue across quarters

The **Revenue Correlation Matrix** shows strong relationships across most quarters, especially between Apr-Jun24 and Jul-Sep24 (0.996). This indicates that the revenue-generating items remained consistent, likely due to stable pricing strategies or consumer preference for high-value items. Such consistency in revenue patterns helps the business ensure stable cash flows and refine marketing strategies for these quarters. However, slightly weaker correlations (0.88–0.93) for Oct-Dec23 suggest that revenue in this period was influenced by additional factors, like increased sales of low-margin items or discounted products.

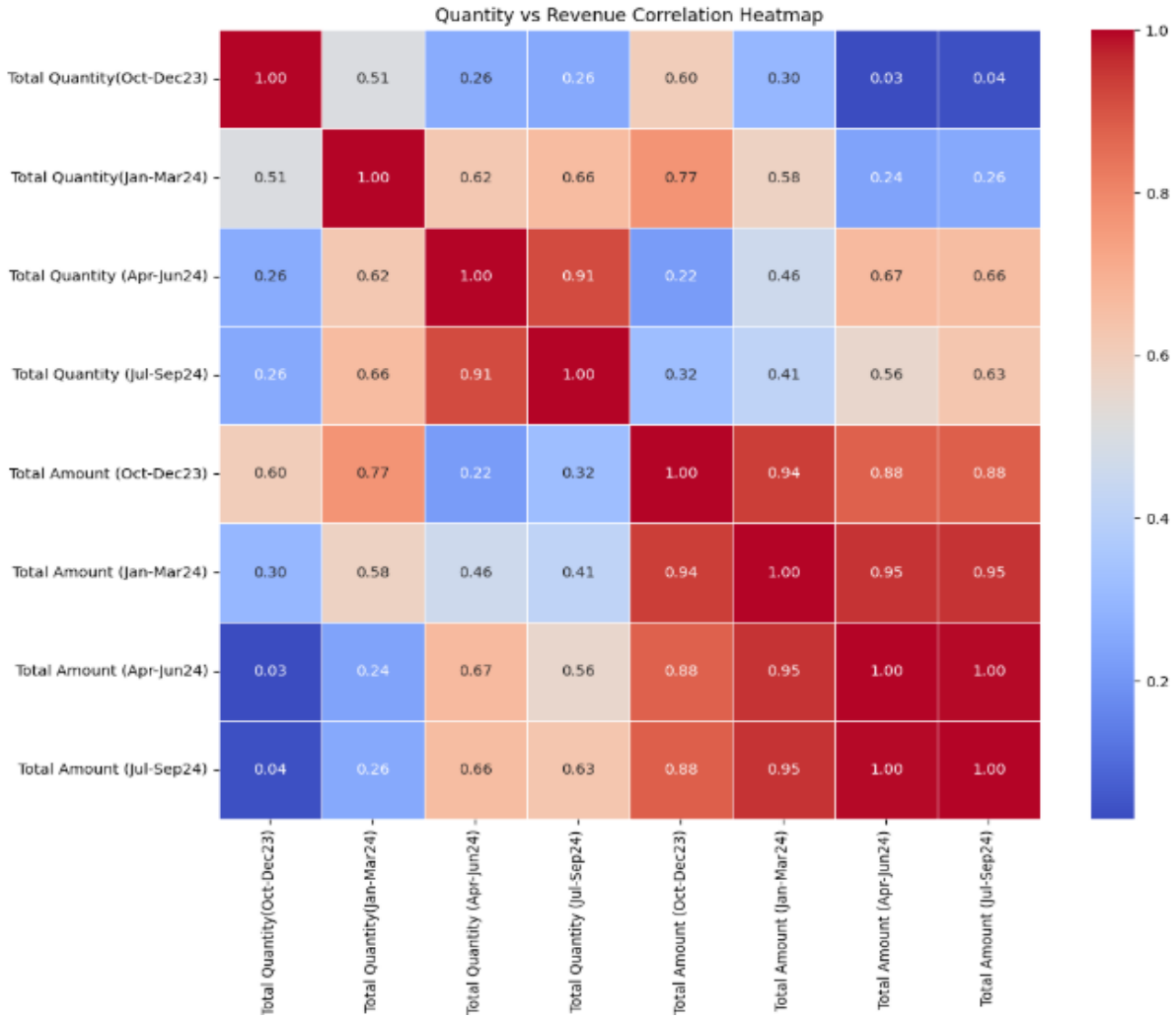


A **high correlation** between two variables indicates a strong relationship, meaning when one variable increase or decreases, the other does so in a predictable way. For instance, in the **Quantity Correlation Matrix**, the high correlation (0.914) between Apr-Jun24 and Jul-Sep24 suggests that the sales quantities during these periods followed a very similar trend. This consistency can help businesses predict future sales patterns, improve inventory management, and minimize stock-outs during high-demand periods.

On the other hand, weaker correlations, such as the one between Oct-Dec23 and the subsequent quarters (0.26–0.50), indicate that sales patterns in this period were quite different, possibly due to seasonal promotions, special events, or differing consumer preferences. This lack of alignment suggests that the business needs to evaluate what unique factors influenced sales in Oct-Dec23.



The **Quantity vs. Revenue Correlation Matrix** highlights how sales volumes correlate with revenue. For earlier quarters, such as Oct-Dec23 (0.604) and Jan-Mar24 (0.772), there is a moderate to strong relationship, showing that higher quantities sold directly influenced revenue. However, in later quarters like Jul-Sep24, weaker correlations (0.32–0.63) suggest that revenue relied more on high-margin products rather than sheer sales volume. This indicates that the business likely optimized its product mix to focus on profitability rather than volume.

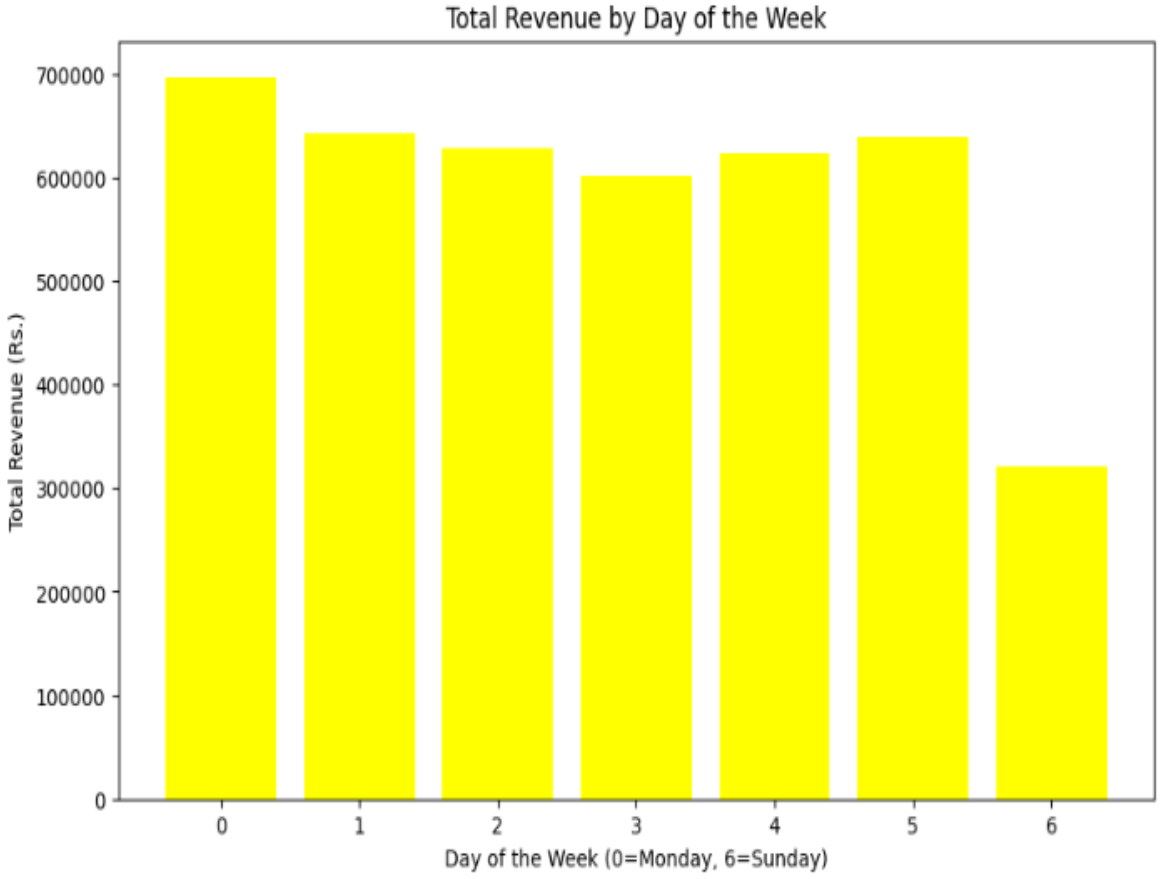


5. Labor Hours Analysis

A2Z Food Court should focus on aligning staffing levels with the monthly revenue fluctuations to optimize labor costs. For instance, during high-revenue months such as **September, August, and June**, staffing should be increased to handle the higher demand, especially on weekends and holidays. However, during the low-revenue months like **January, February, and December**, A2Z Food Court should reduce labor costs by minimizing staffing during weekdays and non-peak hours. This can be achieved by either shortening shifts or reducing the number of employees on duty, ensuring that labor is utilized efficiently without incurring unnecessary costs during slower periods. By adapting staffing levels to match the demand, A2Z Food Court can maintain service quality during peak times while cutting down on labor expenses during low-sales months.

A2Z Food Court should also adjust staffing according to weekly revenue patterns to further optimize labor costs. Analysis of the weekly revenue breakdown shows that sales are highest on

Monday, Tuesday, Wednesday, and Saturday, with **Sunday** being the slowest day. On Sundays, A2Z Food Court should reduce the number of staff scheduled, particularly during non-peak hours, to minimize labor expenses while still maintaining adequate service. During weekdays, particularly Monday through Thursday, staffing should be maintained at a level that ensures smooth operations without overstaffing. By optimizing labor schedules to reflect actual demand on a weekly basis, A2Z Food Court can reduce unnecessary labor costs and improve overall profitability.



Interpretation of Results and Recommendation

- **Optimize Menu Diversification**

A2Z Food Court's over-reliance on a small group of high-performing items, such as Veg Paneer Paratha, Special Thali, and Veg Fried Rice, which contribute 79.8% of total revenue, limits growth opportunities. To address this, the Food Court should diversify its menu by promoting underperforming Category B items like Samosa and Chili Paneer through targeted marketing campaigns or bundling them with popular items. This will help generate interest in less popular options and balance revenue across the menu.

- **Reassess Low-Performing Items**

Category C items, such as V. Coffee and Energy Drink, contribute only 5.2% of revenue despite comprising 52.5% of the total items sold. These items should either be improved through better promotion or removed from the menu to free up resources for more profitable products. This will optimize inventory management and reduce waste.

- **Introduce Seasonal and Innovative Offerings**

Seasonal menu items like festive desserts or summer beverages can attract new customers and create excitement around the menu. Limited-time offers can also encourage repeat visits and boost sales during slower months. Regularly updating the menu based on customer feedback will ensure continued engagement.

- **Leverage Predictable Demand Patterns**

The strong correlation between Apr-Jun24 and Jul-Sep24 indicates consistent demand for high-value items during these quarters. A2Z Food Court should use this predictability to ensure sufficient stock levels for high-demand products while minimizing stock-outs during peak periods.

- **Analyze Inconsistent Sales Trends**

The weaker correlations for Oct-Dec23 suggest that seasonal promotions or external factors influenced sales during this period. A detailed evaluation of these factors can help refine promotional strategies to drive both volume and profitability in future off-peak months.

- **Focus on High-Margin Products**

Later quarters like Jul-Sep24 show a shift toward profitability through high-margin products rather than sheer sales volume. A2Z Food Court should continue optimizing its product mix to focus on high-margin items while maintaining a balance with volume-driven revenue strategies.

- **Align Staffing with Monthly Revenue Patterns**

To reduce labor costs, staffing levels should be adjusted based on monthly revenue fluctuations. During high-revenue months like September, August, and June, additional staff should be scheduled to handle increased demand efficiently. Conversely, during low-revenue months like January and February, shifts should be shortened or part-time workers employed to minimize costs without compromising service quality.

- **Adjust Staffing Based on Weekly Trends**

Weekly revenue patterns indicate higher sales on Monday, Tuesday, Wednesday, and Saturday, while Sunday is the slowest day. Staffing schedules should reflect these trends by reducing staff on Sundays or during non-peak hours while maintaining adequate levels during busy weekdays.

- **Implement Data-Driven Inventory Management**

Using historical data to forecast demand can help A2Z Food Court optimize inventory levels for high-demand items during peak periods while avoiding overstocking low-performing products like Category C items. This will improve operational efficiency and reduce wastage.

- **Enhance Marketing Strategies**

Promotions tailored to specific customer segments can boost sales across underperforming categories like Beverages and Snacks. For example, offering discounts on these items during lunch hours or creating combo deals can encourage customers to explore more options from the menu.

- **Introduce Loyalty Programs**

Loyalty programs that reward customers for trying new or underperforming items can help expand sales beyond top-performing products while fostering customer retention. Points-based systems or exclusive discounts for loyal customers can drive engagement.

- **Adopt Digital Tools for Efficiency**

A robust digital tracking system should be implemented to connect purchase data with sales performance in real time. This will enable smarter financial decisions by aligning purchases with actual demand patterns and ensuring better resource allocation across all menu categories.

By implementing these strategies, A2Z Food Court can optimize its menu offerings, reduce labor costs, improve operational efficiency, and achieve sustainable growth while enhancing customer satisfaction.

End Note

The analyses and recommendations presented in this report are based on the comprehensive dataset provided by **Mr. Pradeep Panwar**, the visionary co-founder of A2Z Facility Management Services (A2Z FMS). His transparency and willingness to share valuable insights about **A2Z Food Court** have been instrumental in conducting an in-depth analysis and formulating actionable strategies. While the findings are tailored to the specific context of A2Z Food Court, it is important to acknowledge that the dynamic nature of the food and beverage industry may impact the implementation and outcomes of these recommendations. Factors such as evolving customer preferences, market trends, and operational constraints could influence their effectiveness. Therefore, continuous monitoring and adaptive adjustments will be essential to maximize the benefits of these strategies.

I extend my heartfelt gratitude to the **Indian Institute of Technology Madras** for fostering an intellectually stimulating environment and equipping us with the tools necessary for solving real-world business challenges. The **Business Data Management course** has been pivotal in honing our analytical skills, and this project has provided a unique opportunity to apply those skills in a practical business scenario.

As I conclude this project, I am confident that the knowledge gained through this experience will serve as a cornerstone in my professional journey. I extend my best wishes for the continued success and growth of A2Z Food Court and look forward to applying these learnings to future endeavors.

Thank you!