Business Case Study

Sales Growth Strategy for an Indian Cuisine Restaurant

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Company Overview

An Indian restaurant offering a mix of dine-in and delivery services was experiencing stagnant growth despite having a decent customer base and a broad menu. The owner wanted to leverage historical order and sales data to uncover business insights, optimize operations, and boost overall revenue.

A comprehensive Exploratory Data Analysis (EDA) and Dashboard Reporting initiative was launched to analyze patterns, improve decision-making, and predict future sales trends.

Challenges and Objectives

🎯 Objective

The primary goal of this project was to:

- Increase overall sales and profitability
- Understand customer behavior and order preferences
- Identify top-performing and underperforming menu items
- Analyze time-based trends to optimize operations
- Develop a dashboard that presents actionable insights for business growth

🗃️ Dataset Overview

The dataset used in the analysis was a Raw CSV file titled “Indian Restaurant Data.csv”. It contained records of customer orders with key fields such as:

- Order Date and Time
- Item Name and Category
- Quantity and Price
- Order Type (Dine-in/Delivery)
- Revenue Metrics

Additional columns such as Month, Day of Week, and Hour were engineered for time-based analysis.

(Strengths)	(Weaknesses)	(Opportunities)	(Threats)
• Rich Historical Data • Clear Sales Trends • Dashboard Integration • Popular Dishes Identified • Custom KPIs	• Missing Customer Demographics • No Cost Data • Limited Order Feedback • Static Analysis • Menu Saturation	• Personalized Offers • Combo Recommendations • Cost-Analysis Expansion • Social Media Integration • Sales Forecasting	• Competitive Market • Changing Customer Preferences • Economic Downturns • Delivery Platform Charges • Operational Constraints

🧪 Process & Methodology

🔍 Data Cleaning & Preparation

- Verified data types and handled missing/null values.
- Created new columns:
  - Revenue = Quantity × Price
  - Extracted Month, Hour, Day of Week from Order DateTime
- Categorized order types into Dine-in and Delivery.

```
df.isnull().sum()
```

```
Order_ID              0
Date                  0
Time                  0
Day                   0
Customer_Type         0
Item_Category         0
Item_Name             0
Quantity              0
Price_Per_Unit        0
Total_Amount          0
Payment_Mode          0
Home_Delivery         0
Customer_Rating       0
Feedback_Comment    176
dtype: int64
```

```
df.dropna(inplace= True)
```

```
df.head()
```

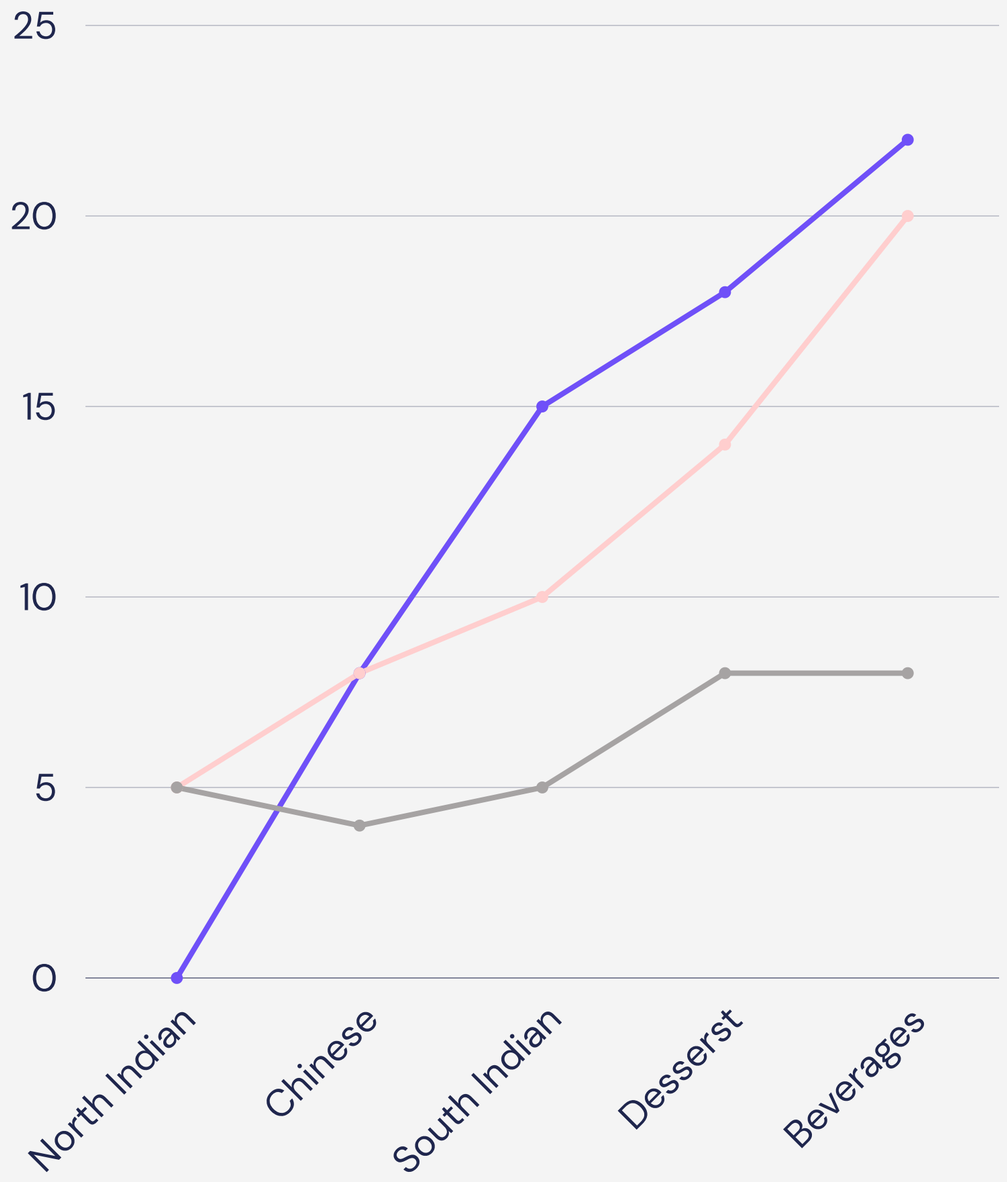
	Order_ID	Date	Time	Day	Customer_Type	Item_Category	Item_Name	Quantity	Price_Per_Unit	Total_Amount	Payment_Mode
0	ORD0001	2025-02-16	11:30:00	Sunday	Returning	South Indian	Idli Sambar	1	238	238	Card
1	ORD0002	2025-02-20	20:45:00	Thursday	New	North Indian	Paneer Butter Masala	2	224	448	UPI

```
# Create new date-related features
df['Month'] = df['Date'].dt.month_name()
df['Year'] = df['Date'].dt.year
df['Weekday'] = df['Date'].dt.day_name()
```

```
df['Date'] = pd.to_datetime(df['Date'], format='%d-%m-%Y')
df['Time'] = pd.to_datetime(df['Time'], format='%H:%M').dt.time
df["Quantity"]=df["Quantity"].astype(int)
df["Price_Per_Unit"]=df["Price_Per_Unit"].astype(int)
df["Total_Amount"]=df["Total_Amount"].astype(int)
df["Customer_Rating"]=df["Customer_Rating"].astype(int)
```

Exploratory Data Analysis (EDA)

Key Insights:
📈 Peak Hours & Days: Highest sales occurred during weekend evenings.
🍛 Top-Selling Items: Biryani, Butter Chicken, and Naan were the top contributors to revenue.
📉 Underperforming Items: Some niche items had consistently low sales and high preparation cost.
🚚 Order Type Analysis: Delivery orders outperformed dine-in in frequency but had lower average order value.
🧭 Category Performance: Main courses generated the highest revenue, while desserts had high margins but lower sales volume.



[70]:
```
# Category Distributions
print(df['Customer_Type'].value_counts())
print(df['Item_Category'].value_counts())
print(df['Payment_Mode'].value_counts())
print(df['Home_Delivery'].value_counts())
```

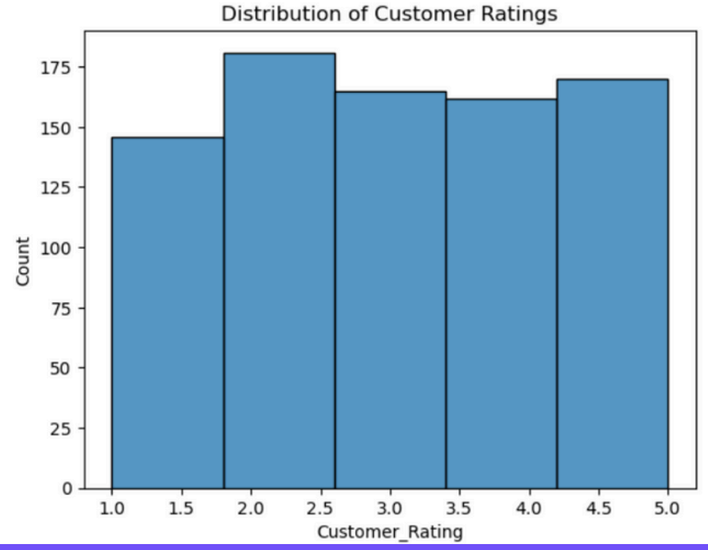
```
Customer_Type
New          439
Returning    385
Name: count, dtype: int64
Item_Category
North Indian    177
South Indian    174
Desserts        167
Chinese         156
Beverages       150
Name: count, dtype: int64
Payment_Mode
Card    282
UPI     273
Cash    269
Name: count, dtype: int64
Home_Delivery
No     415
Yes    409
Name: count, dtype: int64
```

[100]:
```
# Ratings by category
sns.boxplot(data=df, x='Item_Category', y='Customer_Rating')
plt.xticks(rotation=45)
plt.title("Customer Ratings by Item Category")
plt.show()
```

5]:
```
# Revenue by day of week
revenue_by_weekday = df.groupby('Weekday')['Total_Amount'].sum().reindex(
    ['Monday', 'Tuesday', 'Wednesday', 'Thursday', 'Friday', 'Saturday', 'Sunday'])

# Revenue by time of day
revenue_by_hour = df.groupby('Time')['Total_Amount'].sum()

# Average Order Value: New vs Returning Customers
aov_by_customer_type = df.groupby('Customer_Type')['Total_Amount'].mean()

print(revenue_by_weekday)
print(revenue_by_hour)
print(aov_by_customer_type)
```

```
Weekday
Monday       66685
Tuesday      57155
Wednesday    58959
Thursday     74181
Friday       50234
Saturday     64061
Sunday       63714
Name: Total_Amount, dtype: int32
Series([], Name: Total_Amount, dtype: int32)
Customer_Type
New          545.107062
Returning    508.277922
Name: Total_Amount, dtype: float64
```

[98]:
```
# Ratings
sns.histplot(df['Customer_Rating'], bins=5, kde=False)
plt.title("Distribution of Customer Ratings")
plt.show()
```

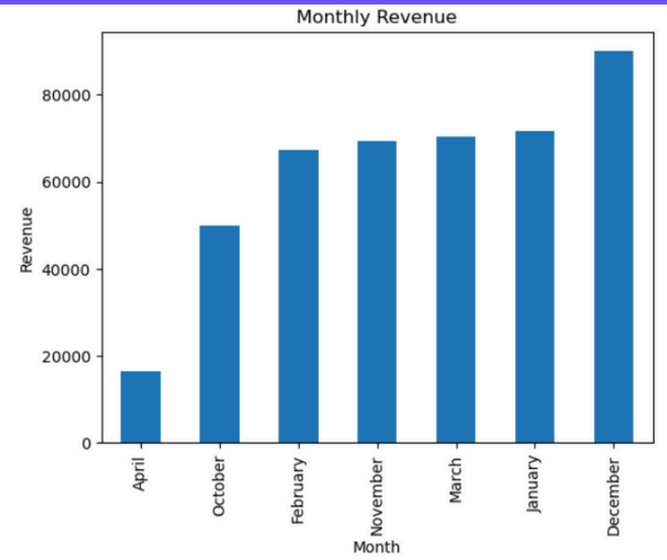


[72]:
```
## 6. Sales & Revenue Analysis
# Total and average revenue
total_revenue = df['Total_Amount'].sum()
avg_order_value = df['Total_Amount'].mean()
print("Total Revenue:", total_revenue)
print("Average Order Value:", avg_order_value)
```

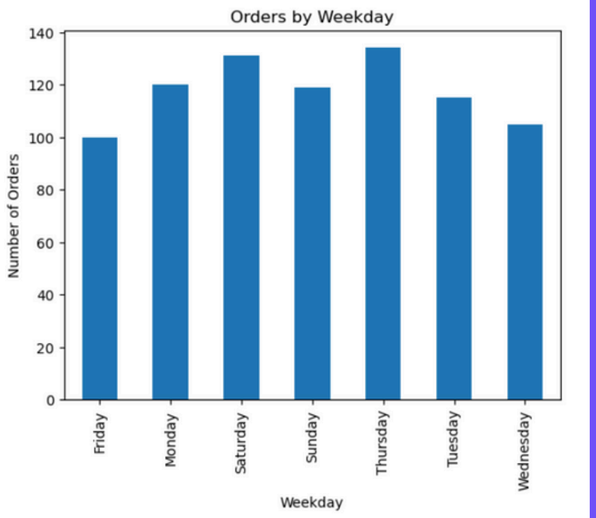
```
Total Revenue: 434989
Average Order Value: 527.8992718446602
```

[76]:
```
#Top items and categories
top_items = df.groupby('Item_Name')['Total_Amount'].sum().sort_values(ascending=False).head(10)
top_categories = df.groupby('Item_Category')['Total_Amount'].sum().sort_values(ascending=False)
print(top_items)
print(top_categories)
```

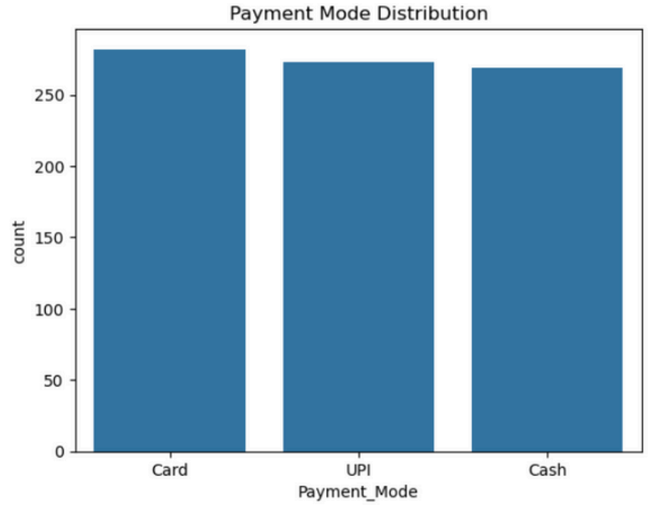
```
Item_Name
Dal Makhani             31612
Manchurian              30379
Uttapam                 26212
Kheer                   24767
Masala Chai             24698
Gulab Jamun             24159
Ice Cream               23690
Paneer Butter Masala    23380
Cold Drink              23063
Veg Noodles             21404
Name: Total_Amount, dtype: int32
Item_Category
North Indian    97043
Desserts        89446
Chinese         85845
```



[104]:
```
# Orders by weekday
orders_by_day = df['Weekday'].value_counts().sort_index()
orders_by_day.plot(kind='bar', title='Orders by Weekday')
plt.ylabel('Number of Orders')
plt.show()
```

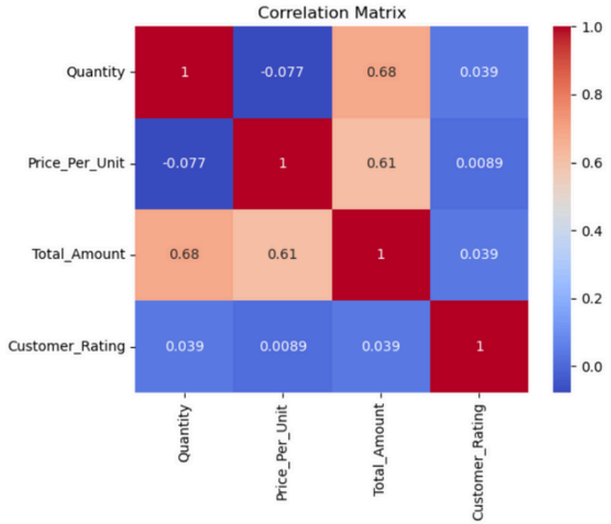


[108]:
```
# Payment and Delivery
# Payment mode preferences
sns.countplot(data=df, x='Payment_Mode')
plt.title("Payment Mode Distribution")
plt.show()
```



[110]:
```
# Home Delivery trends
sns.countplot(data=df, x='Home_Delivery')
plt.title("Home Delivery Orders")
plt.show()
```

[112]:
```
## Correlation Heatmap
numerical_cols = df[['Quantity', 'Price_Per_Unit', 'Total_Amount', 'Customer_Rating']]
sns.heatmap(numerical_cols.corr(), annot=True, cmap='coolwarm')
plt.title("Correlation Matrix")
plt.show()
```



📌Dashboard Development

- KPIs: Total Revenue, Total Orders
- Used line/area charts to display trends in revenue and order volume over time.
- Enabled monthly and daily granularity for in-depth time-series analysis.
- Displayed Top 10 selling items using a bar/column chart, sorted by total revenue or quantity sold.
- Helped identify best-performing products.
- Visualized sales distribution by category using a donut or pie chart.
- Showed the percentage share of each category in the overall revenue.
- Compared Dine-in vs Delivery sales using a stacked bar chart.
- Analyzed customer preference and operational load by order mode.

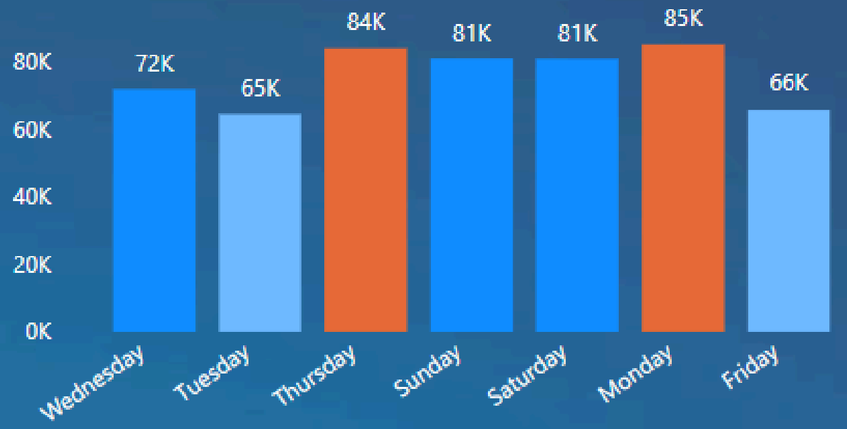
INDIAN RESTAURANT SALES INSIGHTS DASHBOARD

213K
Sum of Profit

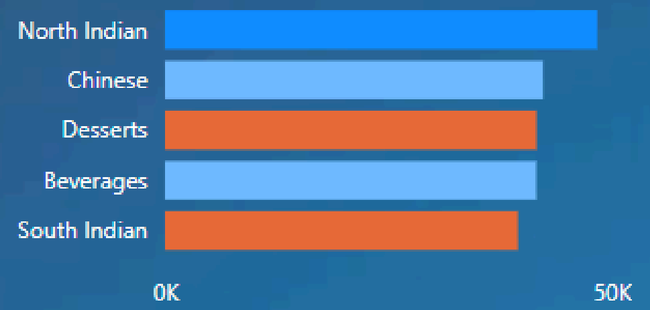
533K
Sum of Total_Amount

Home Deliveries

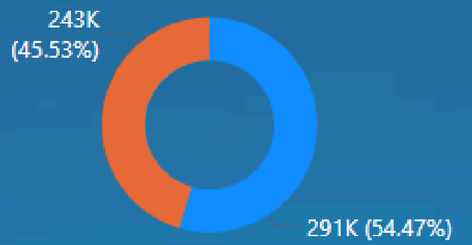
Sales Per Day



Profit Per Category

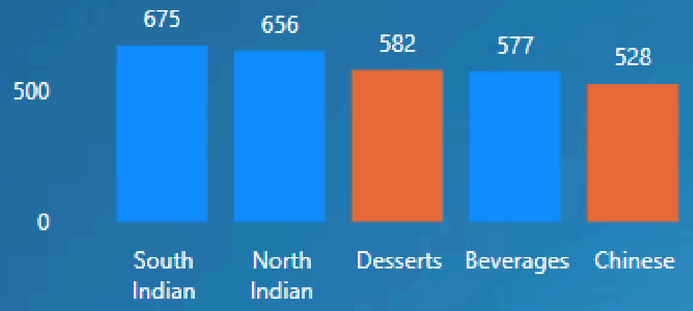


Customer Type

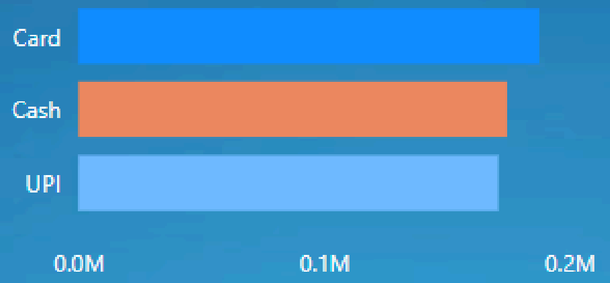


Sale per Month

Rating per Category



Payment Methods



📈 Results & Recommendations

📌 Findings:

🚀 20% of items brought in 80% of revenue (Pareto Principle).

🧾 Delivery orders had higher volume but lower margin — upselling combos can help.

⏱️ Sales were concentrated in specific hours and days — ideal for happy hour deals.

📦 Underperforming items could be phased out or promoted to improve turnover.

📈 Results & Recommendations

💡 Actionable Strategies:

Introduce combo meals for delivery to increase order value.

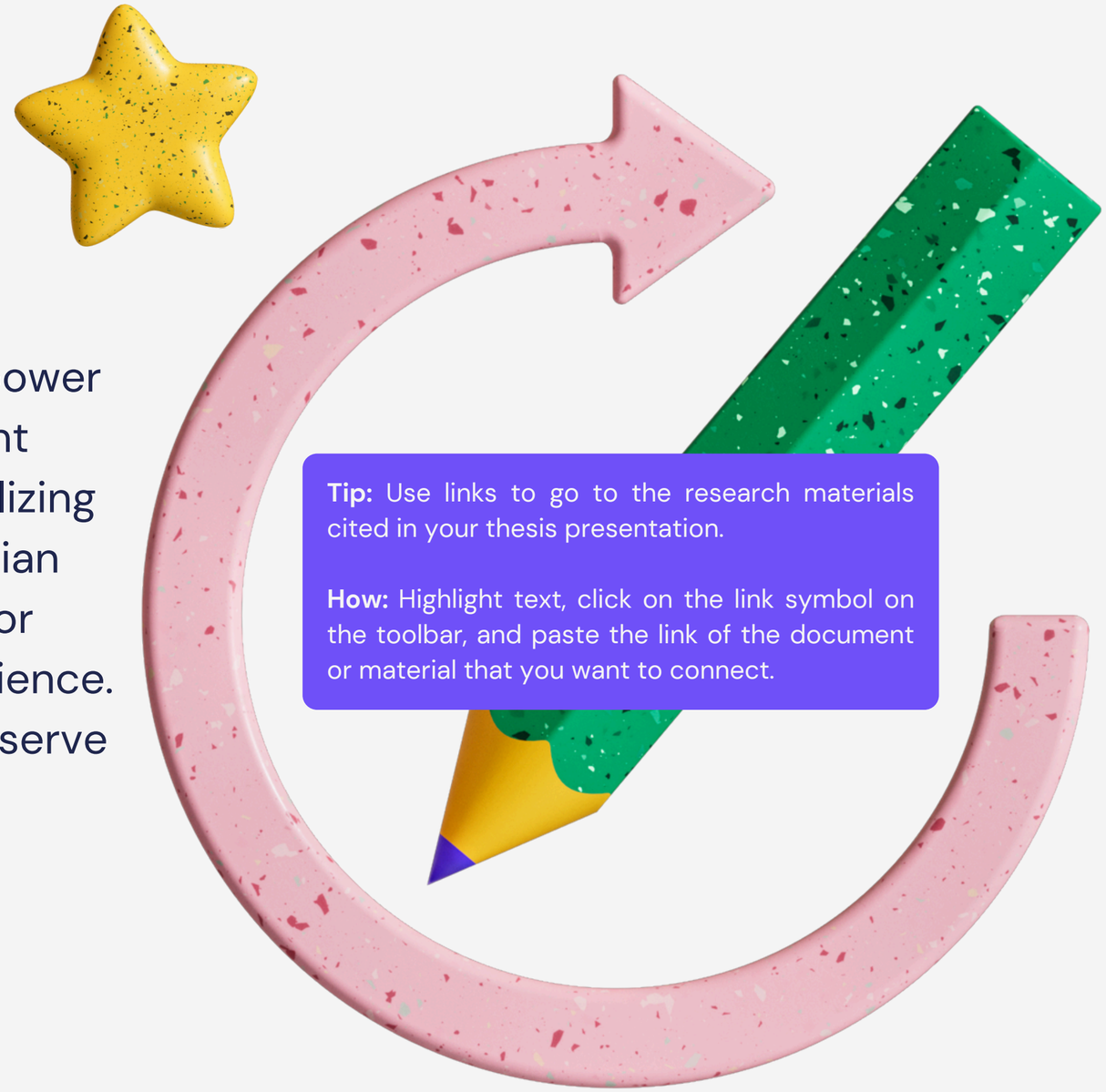
Implement time-based offers during slow hours.

Revamp the menu by removing low-performing dishes.

Focus marketing efforts on best-selling items.

Conclusion

This project successfully demonstrated the power of data analytics in transforming restaurant operations. By analyzing historical data, visualizing key metrics, and forecasting trends, the Indian cuisine restaurant gained clear direction for boosting sales and improving customer experience. Both the Excel and Power BI dashboards now serve as real-time decision-making tools for management.



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