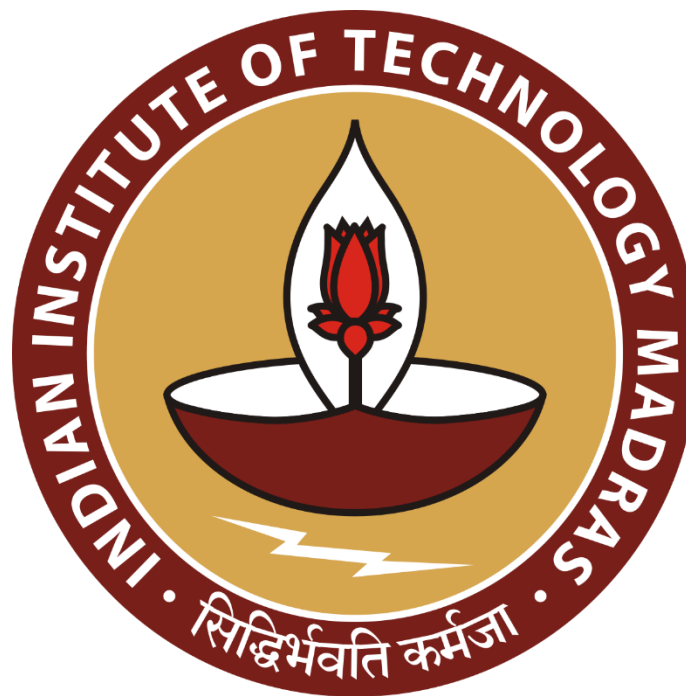# Charting new horizons: Empowering hotel Ananda's performance with powerful strategic insights

A Final report for the BDM capstone Project

Submitted by

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Contents

1. Executive Summary

The project focuses on a restaurant located in Chennai. The business is B2C and deals in the segment of dining and culinary experiences. Hotel Ananda, is a restaurant known for its authentic cuisine.It was started in the year of 1989 which means it has around 35 years of great service and hotel management. It is known for its authentic south Indian cuisine and it even got more popular when they introduced North Indian and Chinese cuisine. The major business issues faced by this hotel are that it has seasonal fluctuation – During holidays/ weekends the sales are going high and because of which few customers go empty handed and inventory management - Customers are buying only certain types of dishes and due to this the remaining dishes are getting wasted.

The issues will be addressed by analyzing historical data analysis, demand forecasting, customer segment analysis, top dishes bought, and top combinations of dishes bought. 1 month sales data for one of the branches is used to analyze the trends. To get the data, I connected with the manager and with his permission, the data was made used for this project. Main analysis will be around finding the temporal trends where the revenue generated is highest and changing the inventory planning accordingly. The second issue will be solved by finding the least and most sold items and combining these 2 will help in reducing the wastage.

All the analysis was made using pyspark and pandas. For this colab notebook was made use and the notebook link is also attached in the report for reference. A power BI dashboard and power point presentation is also included for easy data understanding.

The report submitted includes information regarding the problem statement & Objective, source of data, metadata and descriptive statistics, analytic process especially Market basket analysis along with temporal and other insights, results and findings, recommendation.

The expected outcome helps the organization plan accordingly which helps increase the profitability of the organization. By leveraging analysis and data-driven insights, we can make strategic decisions to address seasonal fluctuations more effectively and optimize hotel's performance throughout the year. The project proposal presents a comprehensive roadmap for success, highlighting the importance of data-driven decision-making and customer-centric approaches in the restaurant industry.

2. Detailed data description

i. Data collection

The data is collected for a month (June month 2023) and the data is shared via excel from the Manager for analysis purpose

All the collected data is uploaded to the colab notebook to do the analysis. The excel is uploaded to colab notebook for analysis

Excel file Link

Colab notebook Link for reference

S.No	Date	DOW	Order Time	Order ID	Order KOT	Food Court	SiteName	VendorName	ItemName	Item Customization	Tax Category	Price	Customization Price	Quantity	ItemTotal	Discount	Tax	Final Price	Packing Charge	GST on Packing Charge	Status	OrderType	Delivery Charge	Payment Details	Order Platform
1	01-06-2023	Thursday	8:51:00 AM	#2416096	1716	iit - madra	IIT - Madras	Hotel Ananda	Idly 2 Pcs (50gms(each)		NON_MRP	22	0	1	22	0	1.1	23.1	5	0	YES	PICK_UP	0	upi : 28.35,	APP
2	01-06-2023	Thursday	8:52:00 AM	#2416105	4091	iit - madra	IIT - Madras	Hotel Ananda	Masala Dosa (160gms)		NON_MRP	54	0	4	216	0	10.8	226.8	0	0	YES	DINE_IN	0	upi : 538.65	APP
3	01-06-2023	Thursday	8:52:00 AM	#2416105	4091	iit - madra	IIT - Madras	Hotel Ananda	Plain Dosa(120gms)		NON_MRP	51	0	2	102	0	5.1	107.1	0		YES	DINE_IN	0		APP
4	01-06-2023	Thursday	8:52:00 AM	#2416105	4091	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	65	0	3	195	0	9.75	204.75	0		YES	DINE_IN	0		APP
5	01-06-2023	Thursday	8:56:00 AM	#2416129	9962	iit - madra	IIT - Madras	Hotel Ananda	Plain Dosa(120gms)		NON_MRP	51	0	1	51	0	2.55	53.55	0	0	YES	DINE_IN	0	upi : 249.9,	APP
6	01-06-2023	Thursday	8:56:00 AM	#2416129	9962	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	65	0	2	130	0	6.5	136.5	0		YES	DINE_IN	0		APP
7	01-06-2023	Thursday	8:56:00 AM	#2416129	9962	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	57	0	1	57	0	2.85	59.85	0		YES	DINE_IN	0		APP
8	01-06-2023	Thursday	9:08:00 AM	#2416213	1013	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	54	0	1	54	0	2.7	56.7	0	0	YES	DINE_IN	0	upi : 106.05	APP
9	01-06-2023	Thursday	9:08:00 AM	#2416213	1013	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	17	0	1	17	0	0.85	17.85	0		YES	DINE_IN	0		APP
10	01-06-2023	Thursday	9:08:46 AM	#2416221	9347	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	45	0	1	45	0	2.25	47.25	0	0	YES	DINE_IN	0	PHONEPE :	POS
11	01-06-2023	Thursday	9:09:53 AM	#2416228	7455	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	22	0	1	22	0	1.1	23.1	0	0	YES	DINE_IN	0	CASH : 88.2	POS
12	01-06-2023	Thursday	9:09:53 AM	#2416228	7455	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	17	0	1	17	0	0.85	17.85	0		YES	DINE_IN	0		POS
13	01-06-2023	Thursday	9:09:53 AM	#2416228	7455	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	45	0	1	45	0	2.25	47.25	0		YES	DINE_IN	0		POS
14	01-06-2023	Thursday	9:15:00 AM	#2416263	3493	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	22	0	1	22	0	1.1	23.1	0	0	YES	DINE_IN	0	upi : 23.1,	APP
15	01-06-2023	Thursday	9:15:00 AM	#2416265	7326	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	57	0	1	57	0	2.85	59.85	0	0	YES	DINE_IN	0	upi : 59.85,	APP
16	01-06-2023	Thursday	9:17:00 AM	#2416275	6836	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	57	0	1	57	0	2.85	59.85	0	0	YES	DINE_IN	0	upi : 59.85,	APP
17	01-06-2023	Thursday	9:19:06 AM	#2416283	9511	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	54	0	1	54	0	2.7	56.7	0	0	YES	DINE_IN	0	CASH : 88.2	POS
18	01-06-2023	Thursday	9:19:57 AM	#2416289	6622	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	45	0	1	45	0	2.25	47.25	0	0	YES	DINE_IN	0	GPAY : 96.6	POS
19	01-06-2023	Thursday	9:19:57 AM	#2416289	6622	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	17	0	1	17	0	0.85	17.85	0		YES	DINE_IN	0		POS
20	01-06-2023	Thursday	9:20:00 AM	#2416291	6747	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	45	0	1	45	0	2.25	47.25	15	0.01	YES	DELIVERY	11.8	upi : 188.2,	APP
21	01-06-2023	Thursday	9:20:00 AM	#2416291	6747	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	51	0	1	51	0	2.55	53.55	0		YES	DELIVERY	0		APP
22	01-06-2023	Thursday	9:20:00 AM	#2416291	6747	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	57	0	1	57	0	2.85	59.85	0		YES	DELIVERY	0		APP
23	01-06-2023	Thursday	9:26:00 AM	#2416324	2266	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	22	0	2	44	0	2.2	46.2	15	0.01	YES	DELIVERY	11.8	upi : 161.95	APP
24	01-06-2023	Thursday	9:26:00 AM	#2416324	2266	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	84	0	1	84	0	4.2	88.2	0		YES	DELIVERY	0		APP
25	01-06-2023	Thursday	9:29:00 AM	#2416345	5983	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	51	0	1	51	0	2.55	53.55	0	0	YES	DINE_IN	0	upi : 53.55,	APP
26	01-06-2023	Thursday	9:29:00 AM	#2416348	5757	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	57	0	1	57	0	2.85	59.85	0	0	YES	DINE_IN	0	upi : 59.85,	APP
27	01-06-2023	Thursday	9:36:00 AM	#2416399	5303	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	51	0	1	51	0	2.55	53.55	0	0	YES	DINE_IN	0	upi : 53.55,	APP
28	01-06-2023	Thursday	9:39:07 AM	#2416422	1261	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	51	0	1	51	0	2.55	53.55	0	0	YES	DINE_IN	0	GPAY : 143	POS
29	01-06-2023	Thursday	9:39:07 AM	#2416422	1261	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	54	0	1	54	0	2.7	56.7	0		YES	DINE_IN	0		POS
30	01-06-2023	Thursday	9:39:07 AM	#2416422	1261	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	17	0	1	17	0	0.85	17.85	0		YES	DINE_IN	0		POS
31	01-06-2023	Thursday	9:40:00 AM	#2416435	8688	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	57	0	1	57	0	2.85	59.85	10	0.01	YES	DELIVERY	11.8	upi : 135.7,	APP
32	01-06-2023	Thursday	9:40:00 AM	#2416435	8688	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	51	0	1	51	0	2.55	53.55	0		YES	DELIVERY	0		APP
33	01-06-2023	Thursday	9:42:00 AM	#2416446	3330	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	54	0	1	54	0	2.7	56.7	0	0	YES	DINE_IN	0	upi : 56.7,	APP
34	01-06-2023	Thursday	9:43:25 AM	#2416450	2933	iit - madra	IIT - Madras	Hotel Ananda	Onion Dosai (200gms)		NON_MRP	65	0	1	65	0	3.25	68.25	0	0	YES	DINE_IN	0	CASH : 68.2	POS

ii.   Data description

There are 25 columns and using pandas, I've analyzed the type of each column

```
 #    Column                  Non-Null Count   Dtype
---   ------                  --------------   -----
 0    S.No                    6792 non-null    float64
 1    Date                    6792 non-null    object
 2    DOW                     6792 non-null    object
 3    Order Time              6792 non-null    object
 4    Order ID                6792 non-null    object
 5    Order KOT               6792 non-null    object
 6    Food Court              6792 non-null    object
 7    SiteName                6792 non-null    object
 8    VendorName              6792 non-null    object
 9    ItemName                6792 non-null    object
 10   Item Customization      64 non-null      object
 11   Tax Category            6792 non-null    object
 12   Price                   6792 non-null    object
 13   Customization Price     6792 non-null    object
 14   Quantity                6792 non-null    object
 15   ItemTotal               6792 non-null    float64
 16   Discount                6792 non-null    float64
 17   Tax                     6792 non-null    float64
 18   Final Price             6792 non-null    float64
 19   Packing Charge          6792 non-null    object
 20   GST on Packing Charge   5012 non-null    object
 21   Status                  6792 non-null    object
 22   OrderType               6792 non-null    object
 23   Delivery Charge         6792 non-null    object
 24   Payment Details         5012 non-null    object
 25   Order Platform          6792 non-null    object
```

b. **S.No:** To mark the index. There are 6794 orders made in the month of June which will be analyzed in the upcoming pages

```
print("Total orders in June is:", df.shape[0])

Total orders in June is: 6794
```

c. **Date:** Date at which the order is made. The date range will be in the format dd-mm-yyyy and the range is (1st June 2023 to 30th June 2023)
d. **DOW:** It is the extra column added by me to understand what day of the week the users are ordering
e. **Order Time:** The time at which order was made . It includes the time and the zone ex) 8:50:00 AM
f. **Order ID:** It is a string that is used to tell one person who made these orders. Instead of their names, we are hashing and using the order ID to find how many users bought the dishes

g. **Order KOT:** Order Kitchen order Ticket is similar to Order ID but these IDs will be used by the kitchen staff.

h. **Food court:** Since there are multiple branches for this hotel, they have mentioned 2 columns to identify the branch and the place name. Here it is a string which is fixed "IIT Madras"

i. **Vendor Name:** Hotel Anandas is the vendor and it is also a fixed column

j. **Item name:** The dishes ordered by the users. It can either be a single dish or can be a combinations of dishes separated by comma

k. **Item customization:** To have customized dishes (For example, if it is paneer manchurian, then it will ask if it is dry/semi gravy/ Gravy). It is stored as a string

l. **Tax category:** It is a fixed string which always displays "Non MRP"

m. **Price:** Price of each dish in object/string format. Each dishes ordered for 1 order ID is written in a different row

n. **Customization price:** An additional charge is being added if there is any customization in the dishes ordered . It is stored as a string

o. **Quantity:** How much quantity is bought for that single dish. Stored as a string format

p. **Item Total:** Calculated as
$$Item\ total\ cost = (Price\ +\ Customization\ charge)\ *\ Quantity$$ and stored as afloat

q. **Discounts**: This column is a fixed column that contains '0' in the whole col

r. **Tax:** Floating type that contains the tax for each column

s. **Final price:** Calculated as

$$Final\ price\ =\ Item\ total\ cost\ +\ Tax$$ and stored as float

t. **Packing price:** Extra packing charges are applied according to the delivery radius

u. **GST on packing charge:** Stored as string and denotes the amount applied as GST for the packing charge. It is 0 if packing charge is 0

v. **Status:** Denotes if the dish is sent or not and stored as string

w. **Order type:** Can contain any of the 3 strings (PICK UP/ DELIVERY / DINE IN)

x. **Delivery charge:** Extra charge is applied if the Order type is delivery

y. **Payment details:** Through which medium the payment was made (UPI/ CASH/ CARD/ POINTS)

z. **Order platform:** String that tells using APP/WEB the order was made

Few of the types are not in the proper format and few columns need to be added to do the analysis. The last row of this data contains one blank row and Total row which needs to be removed before starting the analysis part. Hence, we perform a few data cleaning and preprocessing to make the data clearly understandable.

Data transformation: Few columns like Final Price and Charges etc need to be in float but it is stored as a string. Hence I converted the required column to float, dropped the duplicates if any and changed the date which is in string to datetime and extracted hour from the ordering time column.

```python
df['Quantity']=df['Quantity'].astype(float)
df['Price']=df['Price'].astype(float)
df['Customization Price']=df['Customization Price'].astype(float)
df['Packing Charge']=df['Packing Charge'].astype(float)
df['GST on Packing Charge']=df['GST on Packing Charge'].astype(float)
df['Delivery Charge']=df['Delivery Charge'].astype(float)
###################################################
df["Date"] = pd.to_datetime(df["Date"], format="%d-%m-%Y")
df['Order Time'] = pd.to_datetime(df['Order Time'], format='%I:%M:%S %p').dt.time
df['Hour'] = pd.to_datetime(df['Order Time'], format='%H:%M:%S').dt.hour
```

3. Results & Findings
a. Temporal analysis

Heatmaps are a powerful visualization tool that can be used to identify and analyze temporal trends within data. They provide a visual representation of data values using color gradients, making it easier to spot patterns, variations, and changes over time.

Heatmaps are commonly used to analyze time-series data, where values are collected at different time points. Each row in the heatmap represents a specific time interval, and each column represents a variable or category being analyzed. By coloring cells based on data values, you can quickly identify trends, spikes, and patterns over time.

The day of the week analysis suggests that Thursday morning performs better in terms of both number of orders as well as the revenue. Tuesday is the least performing day of the week. Increasing the cooking level on thursdays and optimizing it on Tuesdays will help in reducing the wastage of the food

Day/Time	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Grand Total
Sunday	0.50%	1.56%	2.21%	0.82%	0.37%	1.16%	1.18%	0.41%	0.09%	0.15%	0.19%	1.21%	1.97%	1.16%	0.50%	0.03%	13.52%
Monday	0.32%	1.63%	1.59%	0.59%	0.63%	1.58%	0.78%	0.34%	0.03%	0.12%	0.18%	1.35%	2.08%	1.52%	0.59%	0.01%	13.34%
Tuesday	0.72%	1.90%	1.49%	0.66%	0.60%	1.18%	0.84%	0.35%	0.19%	0.04%	0.24%	1.09%	1.18%	1.34%	0.40%	0.00%	12.22%
Wednesday	0.32%	1.72%	1.78%	0.75%	0.72%	1.18%	0.87%	0.35%	0.15%	0.04%	0.19%	1.09%	1.60%	1.74%	0.49%	0.03%	13.03%
Thursday	0.57%	2.55%	2.11%	0.90%	0.75%	2.39%	1.31%	0.62%	0.27%	0.13%	0.27%	1.40%	2.80%	2.25%	0.80%	0.00%	19.10%
Friday	0.75%	2.16%	2.22%	0.68%	0.71%	2.05%	1.09%	0.32%	0.06%	0.06%	0.19%	1.28%	2.16%	1.53%	0.63%	0.03%	15.93%
Saturday	0.09%	1.88%	2.53%	0.82%	0.87%	0.90%	1.09%	0.52%	0.03%	0.09%	0.24%	0.97%	1.44%	0.97%	0.38%	0.04%	12.87%
Grand Total	3.28%	13.41%	13.93%	5.23%	4.65%	10.42%	7.16%	2.92%	0.81%	0.63%	1.49%	8.39%	13.24%	10.51%	3.78%	0.15%	100.00%

b. Delivery level analysis

People prefer to dine-in rather than take home or pick up services. Focusing on enhancing the dine-in experience provides diverse opportunities for attracting and retaining customers. The ambiance facilitates social interaction and a break from routines, while friendly staff contribute to positive human connections. Appealing aesthetics align with social media trends, and hosting events fosters a vibrant community hub. Customizable options for special occasions and effective upselling maximize satisfaction and revenue. Addressing health, safety concerns, and emphasizing local sustainability further enriches the experience. Looking ahead, embracing personalized technology, sensory elements, ethical menus, and collaborations will redefine the dine-in encounter. Sustainability-driven smart design, data insights, and seamless tech integration will ensure a memorable, trend-aligned journey.

Delivery type analysis- By orders

DINE_IN 83%
PICK_UP 5%
DELIVERY 12%

Delivery type analysis- By revenue


DINE_IN 82%
PICK_UP 5%
DELIVERY 13%

c. Top Dishes Ordered

In a comprehensive evaluation of the restaurant's dish performance, a notable observation emerges through the application of the Pareto principle, which highlights that merely 15 dishes are responsible for driving a significant 80% of the total orders. To harness the potential of this insight, a dynamic approach is recommended, wherein the best-selling and least-selling dishes are thoughtfully paired to create enticing combos. This innovative strategy not only minimizes food waste but also presents customers with a sustainable and satisfying dining experience.

Incorporating data-driven decision-making, this approach allows the restaurant to adapt its menu offerings in response to evolving customer preferences. By combining quantitative analysis with valuable customer feedback and close collaboration with the kitchen team, the establishment ensures its menu remains attuned to the dynamic culinary landscape. This synergy between data and creativity not only enhances customer satisfaction but also contributes to a more environmentally conscious dining atmosphere.

Furthermore, as a proactive step, the restaurant could introduce introductory offers for these novel combos. Such promotions serve the dual purpose of enticing customers to explore a diverse range of dishes while maximizing sales potential. This strategic pricing strategy, coupled with the harmonious fusion of top and least selling dishes, holds the potential to captivate a wider audience and elevate the overall dining experience

Top dises ordered
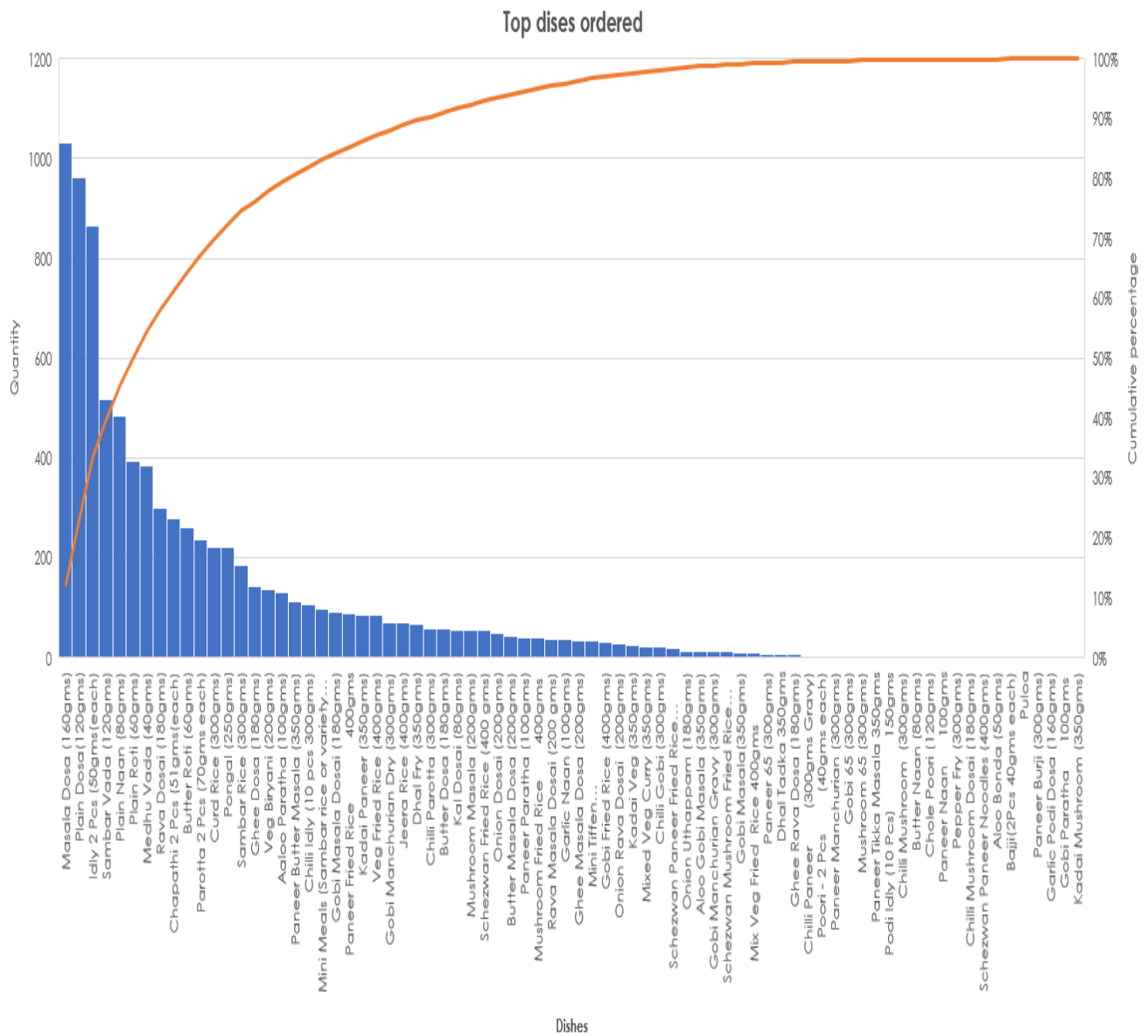
d. Top combination of dishes ordered

The process involved calculating the total orders attributed to each order ID, filtering for those with multiple dishes, and then aggregating based on grouped items to uncover the users' most preferred combinations of dishes.

Despite the hotel primarily offering a North Indian menu, it's noteworthy that the most preferred dishes revolve around the South Indian selection. These include classics like Medhu vada, along with Dosa served with Sambar vada and Masala dosa, in addition to the ever-popular plain dosa.

To enhance the understanding of dish popularity and potential combinations, a treemap visualization was employed. This graphical representation offers a hierarchical view of dish distribution, with larger rectangles indicating higher order frequencies, aiding in the identification of strategic pairings and facilitating informed menu adjustments.

Utilizing these insights, future strategies could involve creating special meal deals or bundles based on the identified popular dish combinations, introducing targeted promotions to encourage customers to explore these preferred options, and enhancing the overall dining experience by ensuring the availability and quality of these favored dishes. Additionally, considering customer feedback and preferences, the restaurant could explore opportunities for innovation and variation within these popular combinations to cater to a wider range of tastes.

4. Power BI Dashboard

Power BI Desktop emerges as an invaluable asset in revolutionizing the hotel industry's data-driven approach. Through its sophisticated dashboard capabilities, hotels can unlock comprehensive insights into their operations, thereby fostering more informed decision-making and strategic planning. This platform empowers hotels to delve deep into critical facets of their business via visually compelling representations.

Incorporating temporal data within the dashboard serves as a strategic move, enabling hotels to unravel intricate patterns and trends in customer behavior over time. Such insights are pivotal for optimizing various operational aspects. For instance, by identifying peak hours and seasons, hotels can proactively manage staffing levels, ensuring impeccable service delivery during high-demand periods. Furthermore, the analysis of temporal data facilitates effective inventory management, preventing shortages or excesses in supplies.

The integration of data related to delivery types enriches the dashboard's utility by offering a lens into the hotel's logistical dynamics. By studying the popularity of different delivery options, hotels can streamline their processes to guarantee swift and accurate order processing. Timely deliveries, facilitated by this informed approach, ultimately contribute to elevating customer satisfaction and engendering loyalty.

The incorporation of the Anandas hotel logo within the dashboard is a strategic design choice that enhances branding and visual identity. This inclusion not only imparts a sense of familiarity and trust but also reinforces the hotel's distinct presence. The logo creates a consistent and polished appearance across the dashboard, resulting in a cohesive and immersive user experience.

While other tools like Excel visualizations or PowerPoint slides could have been employed for analysis, the decision to embrace Power BI underscores the drive for exploration and learning. The meticulously designed dashboard is a testament to Power BI's prowess in dynamic data visualization. It adeptly showcases the platform's interactive features, providing insights into top-selling dishes, preferred combinations, and temporal trends.

Comprising two meticulously crafted pages, this dashboard marks a significant step towards embracing innovation and continuous improvement within the hotel industry. By leveraging Power BI Desktop's user-friendly interface and interactive elements, hotels can foster a culture of data-driven innovation. This, in turn, leads to heightened operational efficiency, improved decision-making, and an unparalleled guest experience.
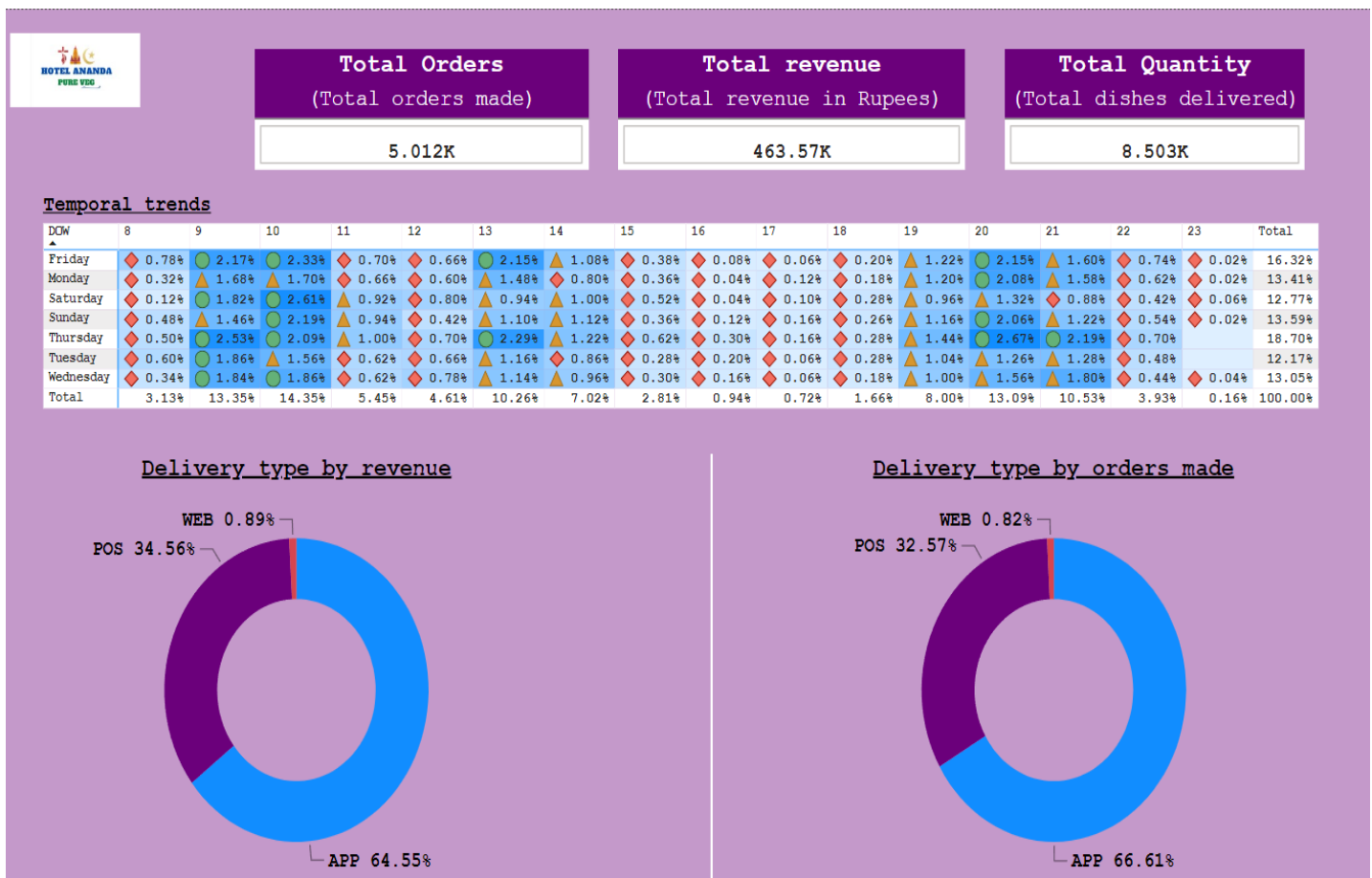
The dashboard comprises of 2 pages

Page 1:

The initial page offers a comprehensive overview of sales data, including order statistics and revenue figures, while also presenting insights into temporal trends and the performance of different delivery types

Here, a variety of visualizations have been incorporated. These include tiles for displaying numerical data, heatmaps to delve into temporal trends featuring icons that represent sales, and pie charts showcasing delivery type distribution.

 The dashboard can provide a comprehensive overview of the hotel's performance. You can analyze revenue trends over time, identify peak booking periods, and monitor fluctuations in order volume. This information can help you make informed decisions about staffing, pricing, and marketing efforts.

Delivery Type Analysis: Understanding which delivery types (e.g., web, POS, APP) are more popular and can guide strategic decisions.

DOW	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Total
Friday	0.78%	2.17%	2.33%	0.70%	0.66%	2.15%	1.08%	0.38%	0.08%	0.06%	0.20%	1.22%	2.15%	1.60%	0.74%	0.02%	16.32%
Monday	0.32%	1.68%	1.70%	0.66%	0.60%	1.48%	0.80%	0.36%	0.04%	0.12%	0.18%	1.20%	2.08%	1.58%	0.62%	0.02%	13.41%
Saturday	0.12%	1.82%	2.61%	0.92%	0.80%	0.94%	1.00%	0.52%	0.04%	0.10%	0.28%	0.96%	1.32%	0.88%	0.42%	0.06%	12.77%
Sunday	0.48%	1.46%	2.19%	0.94%	0.42%	1.10%	1.12%	0.36%	0.12%	0.16%	0.26%	1.16%	2.06%	1.22%	0.54%	0.02%	13.59%
Thursday	0.50%	2.53%	2.09%	1.00%	0.70%	2.29%	1.22%	0.62%	0.30%	0.16%	0.28%	1.44%	2.67%	2.19%	0.70%		18.70%
Tuesday	0.60%	1.86%	1.56%	0.62%	0.66%	1.16%	0.86%	0.28%	0.20%	0.06%	0.28%	1.04%	1.26%	1.28%	0.48%		12.17%
Wednesday	0.34%	1.84%	1.86%	0.62%	0.78%	1.14%	0.96%	0.30%	0.16%	0.06%	0.18%	1.00%	1.56%	1.80%	0.44%	0.04%	13.05%
Total	3.13%	13.35%	14.35%	5.45%	4.61%	10.26%	7.02%	2.81%	0.94%	0.72%	1.66%	8.00%	13.09%	10.53%	3.93%	0.16%	100.00%

Page 2:

Page 2 delves deeper into the orders placed. This page is divided into two sections: on the left, it presents the top individually ordered dishes, while on the right, it highlights the most popular combinations of dishes. To enhance clarity, understanding, and readability, images were employed instead of other visualizations. All analyses were conducted using Colab, and the resulting CSV file was utilized to populate the dashboard

From the left side visualization, insights can be drawn regarding the top-selling dishes at Hotel Anandas, primarily consisting of a variety of South Indian dishes.

On the right-hand side, the visualization highlights the most frequently selected dish combinations by users. Additionally, there's an observation on the dishes with the lowest sales.

To enhance efficiency and revenue performance, a strategic approach involves the combination of highest-selling and lowest-selling dishes. For instance, a potential solution could be the creation of a new combination, such as pairing a top-selling item like "parotta" with a lesser-selling option like "juice" or an "energy drink." This approach aims to minimize wastage and enhance overall operational performance. Conversely, an opportunity exists to introduce compelling combos by pairing two of the best-selling dishes, such as an "Idly + Vada" combo.

5. Future scope
a. Modifying the inventory control

Rather than acquiring a consistent quantity of raw materials for daily cooking, a more effective approach would involve procuring larger amounts of raw materials on high-demand days such as Thursdays, while scaling down purchases on lower-demand days like Tuesdays. This strategy ensures that raw materials remain fresh and minimizes dish wastage, optimizing resource utilization

b. A Multifaceted Approach to Attracting and Delighting Customers

A valuable recommendation stemming from this analysis is to invest significant efforts in enhancing the dine-in experience for customers. Prioritizing improvements in the ambiance, staff interactions, and overall environment can create diverse opportunities to attract and retain patrons. By fostering a welcoming and interactive space, the restaurant can provide a much-needed break from daily routines, facilitating positive social interactions and connections.

c. Blend high-performing and low-performing dishes

The restaurant could introduce introductory offers for these novel combos. Such promotions serve the dual purpose of enticing customers to explore a diverse range of dishes while maximizing sales potential. This strategic pricing strategy, coupled with the harmonious fusion of top and least selling dishes, holds the potential to captivate a wider audience and elevate the overall dining experience

d. Begin digital ads, conquer competitors.

While Hotel Anandas shares the food court with other South Indian and North Indian vendors, it can expand its reach effectively through targeted digital marketing. Utilizing platforms such as YouTube and display ads, especially considering the digital preference of IIT Campus students, can help draw in a broader and more relevant audience. Employing competitor conquesting strategies can further bolster the effectiveness of this approach.

Hotel Anandas has untapped potential in its offerings of North Indian and Chinese cuisines, which often go unnoticed. To attract a larger customer base, digital marketing efforts and promotional offers can be introduced, shedding light on these lesser-known dishes and driving more user engagement.

6. **Timeline for plan implementation**
   a. **Timeline for Menu Optimization**

Week 1:

1. Create a menu team consisting of the restaurant owner, head chef, and key staff members.
2. Brainstorm ideas for combining top selling and least selling dishes in a planned way such that the combination will become a hit.

Week 2:

1. Develop a new menu layout and design that aligns with the restaurant's brand and target audience.
2. Incorporate the identified improvements, such as highlighting popular dishes and remove the items from the menu that won't contribute much to the sales.

Week 3:

1. Finalize the new menu design and content.
2. Print and distribute the updated menus throughout the restaurant and update it in the app.

Week 4 and onwards:

1. Collect customer feedback on the new menu items and make necessary adjustments as needed.
2. Continuously monitor sales data and customer preferences to identify trends and optimize the menu.

b. Timeline for digital conquesting

Week 1:

1. Audience Segmentation: Begin by identifying the gender demographics that display the highest affinity towards South Indian cuisine. This can be accomplished through diverse data sources like website behavior, domain insights, relevant keywords, and sentiment analysis.
2. YouTube Channel Identification: Investigate and pinpoint the most popular YouTube channels that center around South Indian and general food content. This step is crucial for understanding the digital landscape and potential platforms for engagement.
3. KPI Definition: Lay down the foundation for the project's success by establishing Key Performance Indicators (KPIs). These metrics could encompass customer satisfaction ratings, sales growth, and delivery service efficiency. Having clear KPIs in place ensures an objective evaluation of the implemented strategies.

Week 2:

1. Test Campaign Launch: Initiate a preliminary campaign by targeting the identified audience segment through digital channels like display ads and YouTube advertisements. This phase is pivotal in gauging the audience's receptiveness to the campaign content.
2. Ongoing Analysis: Continuously monitor user behavior post-campaign launch. Analyze the traffic on the website and observe conversion rates among users who engage with the campaign. If the desired sales growth isn't evident, be prepared to adapt and adjust the targeting strategy accordingly.
3. Data Collection System: Implement a robust system for collecting and tracking data related to the established KPIs. Regular data updates and analysis will provide real-time insights into the effectiveness of the campaign strategies.

Week 3:

1. Cart Abandonment Strategy: Utilize pixels and tracking mechanisms to identify users who add items to their cart but don't complete the purchase. Employ retargeting techniques to re-engage these users, nudging them to finalize their orders.
2. Audience Segmentation Refinement: Divide the audience into two distinct pools: "Prospecting" for first-time users exposed to the ad and "Retargeting" for users who have been re-engaged. Analyze which pool exhibits a more favorable response to the campaign, and allocate resources accordingly to optimize outcomes.
3. Budget Allocation: Based on the insights garnered from the audience segmentation and response analysis, adjust the budget distribution between the prospecting and retargeting campaigns. This dynamic allocation ensures a focus on the campaigns that yield the most promising KPI improvements.

The outcome facilitates the organization in formulating detailed strategies, thus bolstering its profitability. By harnessing the power of analysis and insights extracted from data, we can adeptly steer through temporal shifts and consistently elevate the hotel's performance across the entirety of the year. The introduction of novel dish combinations has the potential to pique users' interest, enticing them to explore these offerings. Employing advertising technology to effectively communicate these new additions can further drive a higher volume of patrons to the restaurant.

The project lays down a comprehensive roadmap toward achieving success. It prominently emphasizes the crucial significance of making decisions rooted in data and adopting a customer-centric approach, both of which are integral to the realm of the restaurant industry.