# Customer Segmentation and Price Optimization Strategies for Singi's kitchen

**A Proposal report for the BDM capstone Project**

Submitted by

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## Contents:

## Declaration Statement

I am working on a Project Title "**Customer segmentation and Price Optimization Strategies for Singi's kitchen**". I extend my appreciation to **Singi's kitchen**, for providing the necessary resources that enabled me to conduct my project.

I hereby assert that the data presented and assessed in this project report is genuine and precise to the utmost extent of my knowledge and capabilities. The data has been gathered through primary sources and carefully analyzed to assure its reliability.

Additionally, I affirm that all procedures employed for the purpose of data collection and analysis have been duly explained in this report. The outcomes and inferences derived from the data are an accurate depiction of the findings acquired through thorough analytical procedures.

I am dedicated to adhering to the information of academic honesty and integrity, and I am receptive to any additional examination or validation of the data contained in this project report.

I understand that the execution of this project is intended for individual completion and is not to be undertaken collectively. I thus affirm that I am not engaged in any form of collaboration with other individuals, and that all the work undertaken has been solely conducted by me. In the event that plagiarism is detected in the report at any stage of the project's completion, I am fully aware and prepared to accept disciplinary measures imposed by the relevant authority.

I agree that all the recommendations are business-specific and limited to this project exclusively, and cannot be utilized for any other purpose with an IIT Madras tag. I understand that IIT Madras does not endorse this.

Signature of Candidate: (**Digital Signature**)

Name: Sharad Anirudh Jonnalagadda
Date:
2/10/2024

## A brief summary about “Singi’s kitchen”, it’s major problems and a possible approach for the solution (Executive Summary)

This project works upon a community restaurant named “**Singi’s kitchen**”, located inside an upscale community of **Saket Bhu: Sattva** in Kompally, Hyderabad. The restaurant offers food from different cuisines with both dining and takeaway options available. The restaurant was opened in September of this year and currently is not available on food delivery platforms such as Zomato or Swiggy.

The major concerns about this restaurant are, very minimal profit is being generated by the restaurant, there are a lot of issues with staff management. The restaurant also lacks a proper registry in terms of Inventory management and sales data management, the takeaway orders are currently being taken on WhatsApp, showcasing that it lacks a proper management system to handle this restaurant.

The approach that would be used involves analyzing each and every house in Saket **Bhu: Sattva,** based on the number of orders they put in a stipulated period of time and comparing it with other factors such as the average age of the people in the house, their monthly income, their background and their dietary preferences. This would ultimately help us in creating a **Grid Heat map**. Each house would be numerically rated in the range from **0(Blue)** to **1(Red)**, using this analysis and also data from inventory management a profitable menu can be crafted.

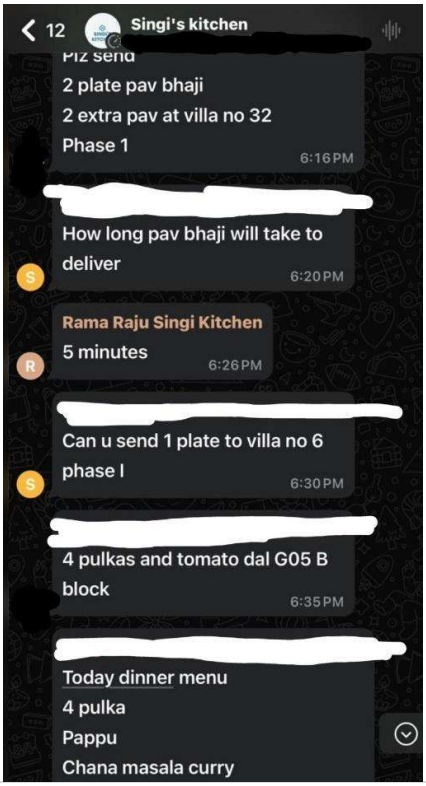
## Organization Background

***Name: Singi’s kitchen***
***Owner: Mr. Rama Raju Singi***
***Address: Villa 189, Saket Bhu sattva, Hyderabad, Kandlakoya, Telangana 501401***

The restaurant that I am working on, “**Singi’s kitchen**”, was opened in the September month of 2024. The restaurant owner, Mr. Rama Raju Singi is a successful restauranter, who already owns a successful restaurant named “Maryada Ramanna”. The restaurant offers both vegetarian and non-vegetarian food options, and has a delivery system specially dedicated to the residents of Saket: Bhu Sattva. The target Customers of this restaurant for time being are the residents of Saket Bhu: Sattva, while it also has ambitions to expand it’s reach and establish itself over platforms such as Zomato and Swiggy. The restaurant is a single floored diner, with almost ten tables, and as it is a new establishment, much of the restaurant is still a work in progress, with facilities such as ACs and TVs not yet available. The restaurant takes orders primarily through WhatsApp for delivery and doesn’t yet have a proper digitalized management system to keep track of Inventory or Sales. Picture 1.1 and Picture 1.2 are presented down below, where I have personally met the owner and had a discussion with him to understand all of the above insights and the second picture is just an image showcasing how home delivery orders are placed, and how the customers also interact with the owner as well.

***Picture 1.1***

*Meeting with Mr. Rama Raju Singi(Right in Singi's Kitchen for an insightful discussion.*




***picture 1.2***

*A picture of Singi's kitchen WhatsApp group, where all of the home delivery orders are placed and also a place where customers can directly interact with the owner himself.*

# Problem Statement

After my interaction with the owner, I have managed to find out three objectives where I should work to improve the restaurant′s situation:
*Store doesn′t have knowledge about it′s customer base, it doesn′t exactly know the demographics of their customers.
*The restaurant doesn′t know which item in their menu is the most popular one and which item hands them the most amount of profit.
*The restaurant doesn′t use fridges, so it needs a much more sophisticated Inventory management system to ensure profitability to the restaurant.
There are three major problems in the restaurant which need to be addressed to improve its profitability and accountability, and the problem statements are formulated below:

**(1) Customer Segmentation and Targeting**:

The restaurant lacks a proper database management system which addresses its customer base, this leads to a decline in profits for not rewarding loyal customers and for not polarizing infrequent customers.

**(2) Menu items Optimization**:

The restaurant does not have a clear idea about their most and least popular items on the menu. This results in missed opportunities for amassing better profits and increasing customer engagement.

**(3) Inventory Management**:

The restaurant condemns the usage of fridges making the process of Inventory management a much more complicated process. The stock-ups and stock-outs must be carefully analyzed and addressed, otherwise the restaurant would have to bear the burden of severe losses.

# Background of the Problem

Singi's kitchen, a restaurant that offers food from variety of cuisines, including north Indian food items such as butter chicken, Rogan josh curry and Chinese starters like chilly chicken, all the way to south Indian breakfast items such as idly, dosas and etc. has found itself in a problematic situation thanks to the residents of the upscale community, who come from diverse backgrounds and also the age demographics of the community widely vary from person to person. As Singi's kitchen is a new establishment, there is a lack of proper database management systems to register and keep a track of the inventory. Moreover, as the restaurant is a new establishment, it doesn't keep a track of its customer base, so essentially, the restaurant has no clear idea of who their loyal customers are, and what their most popular item is. As most of the sales data is unstructured, they lack a proper understanding on how to build an optimal menu to amass highest number of profits. The owner of the restaurant believes in serving fresh food every day, so there is no concept of fridges, as the owner believes it would deteriorate the overall quality of the food. This in turn would cause a lot of inventory related issues as the stock-ups and stock-outs would be more rapid which would need more sophisticated Inventory management systems but the restaurant not having any is also a sign of concern.

# Problem solving Approach

The approach that would be used for solving the problem is broken down into two main strategies. The first strategy involves segmentation of the community of the Saket Bhu: Satva, into $1 \times 1$ grids which would be numerically rated from a scale of 0 to 1 and would be color encoded accordingly based on multiple factors but majorly over their frequency of orders. The second strategy is in a way, combining the results obtained from the first strategy and the analysis obtained from Inventory management to construct a menu that is optimal, which would further attract the frequent customers, help in polarizing the infrequent customers and also help in attaining an optimal profit for the restaurant based on the given constraints. Given below is a more methodical breakdown of the procedures employed:

***(1) Customer Segmentation and Targeting***:

Firstly, data will be collected regarding the sales of Singi's Kitchen, including the dine-in sales data as well as the home delivery sales data will also be gathered. The data records collected can be expected to be extensive, almost a month long of sales data will be gathered which is basically from the inception of the restaurant itself. After successful completion of gathering all of the sales data, a separate survey will be conducted inside of the Saket Bhu: Satva community, to understand more about the preferences of the residents, their expected monthly income, their dietary preferences, their background and few more features could be added at the end to increase the value of the survey but the additional features will be based around the premises of mentioned features. (This is to be informed that all of the data collected from the residents will be collected in a very discrete manner, all of their data would be kept confidential and it would be clearly mentioned to the residents as well, that all of this information is only for analysis purposes.)

As the community consists of about 200 villas, it would take nearly 3-4 days to collect all the necessary data to perform a good statistical and inferential analysis. After the collection of both Sales data and Survey data, the analysis part of the Customer segmentation would commence. All of the data would be put under a mathematical model to achieve a "*rating score*". A mathematical model would be developed keeping in mind, that frequency of the orders from that house is combined with it's potential to stay attracted to the restaurant in future. This mathematical model would combine all of the features of the survey data with their record of the sales data with appropriate coefficients to generate a numeric quantity which is strictly between 0 and 1, both the values are inclusive, which would be termed as "*rating score*" from hereon. So, this overall "*rating score"* would display the homes in two broadly different categories, "*High potential unit*" and "*Low potential unit*". A *High potential unit* is a home which would have a value greater than a certain threshold (say 0.75), and a *Low potential unit* is a home which would have value lesser than a certain threshold (say 0.35). A map will be constructed which would display all of the 200 villas in the community and each home will be a "*unit*". These *units,* are $1 \times 1$ grids which will be color-coded as closer to Red if the unit is closer to the value of 1, and would be color-coded as Blue if it's closer to 0. Any units with intermediate values will have color values as combination of red and blue in right proportions. Finally, we obtain a **Grid Heat map** which could easily highlight potential customers, trends and areas to target for better profitability. *Figure 1.1* has been provided below as an example of what the grid heat map may look like. This is just an example in terms of the visual aspects and is not an accurate representation of how the Grid Heat

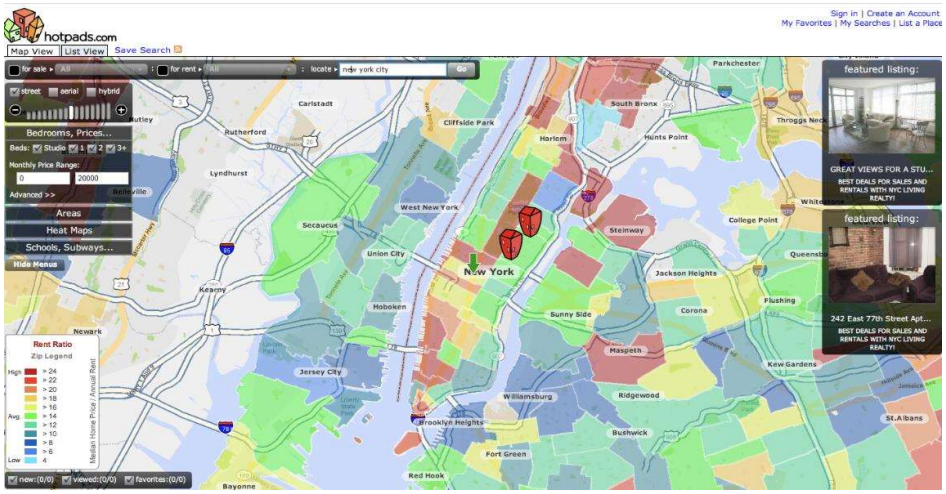
map may look like. This figure was borrowed from a website to which proper source is mentioned.

(***2) Menu Items Optimization***: **-**

This process will start simultaneously with the collection of Sales data. In the second part of the problem, the data regarding Inventory management would be calculated, The Stock ups, the Stock outs of the restaurant, how frequently items such as vegetables, meat, spices, containers, drinks and etc., are brought and how long it takes them to finish off the resources. The collection of this data is extensive as well, almost a month-long data will be collected once again. Once the data is collected regarding Inventory, the results from the first strategy will be combined with the results obtained from Inventory management and then, price for each item on the menu will be revised, making sure that frequent customers stay attracted where as infrequent customers get attracted too. The primary objective of this is to ensure that the restaurant yields maximum profit possible and secondary objective is to ensure that the loyal customer base stays and the infrequent costumers get attracted to the restaurant as well.

**(3) Inventory Management**: **-**

The process of collecting Inventory data is part of the second strategy itself, where all of the inventory data will be collected and all of the data will be organized and cleaned, making sure to correctly record all of the important events such as Stock-ups and Stock-outs. In the part of Analysis which is a part of second strategy once again, a thorough data analysis will be performed where all of the inventory data will be thoroughly analyzed. Major focus will be on *stock usage patterns* and *turnover rates,* and using this data, an efficient inventory management model can be built, where the restaurant wouldn't have to bear the burden of not having enough resources when required or expiring of the products due to it's prolonged stay in the shelves. This would be the approach for dealing with the issue of Inventory management, once again, this is a part of the second strategy itself but it enables us to solve the third most important problem of this restaurant.




**Grid Heat map example**

*Figure 1.1*

*This picture is for illustration purposes only and is not a representation of the current problem.*

*(Source: - https://techcrunch.com/2008/06/10/not-sure-whether-to-rent-or-buy-check-the-heat-map/*

*Name of the website: -TechCrunch (www.TechCrunch.com))*

# Expected Timeline

## *(1) Work Breakdown Structure: -*

The work is broken down into three phases namely, “Data collection”, “Data Analysis” and “Strategy Implementation”. From there the work is broken down further into sub-tasks which are elaborated quite clearly in Figure 1.2. A clear and concise WBS diagram has been provided below.

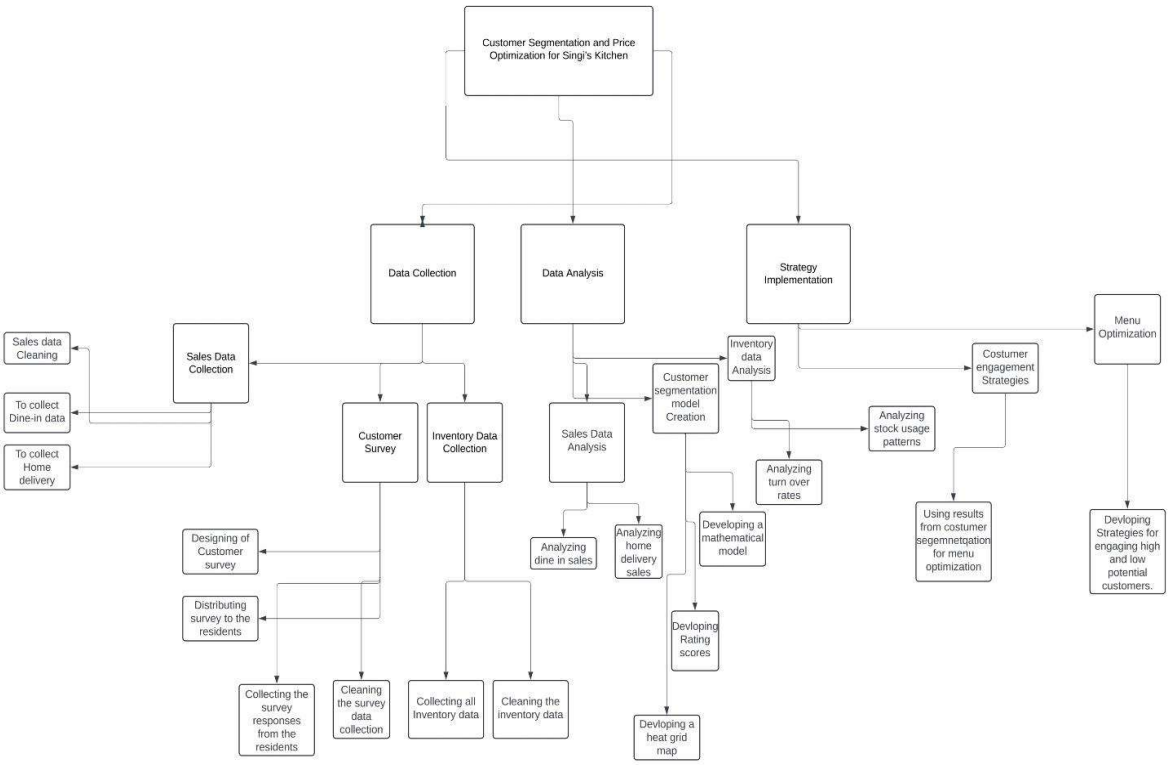
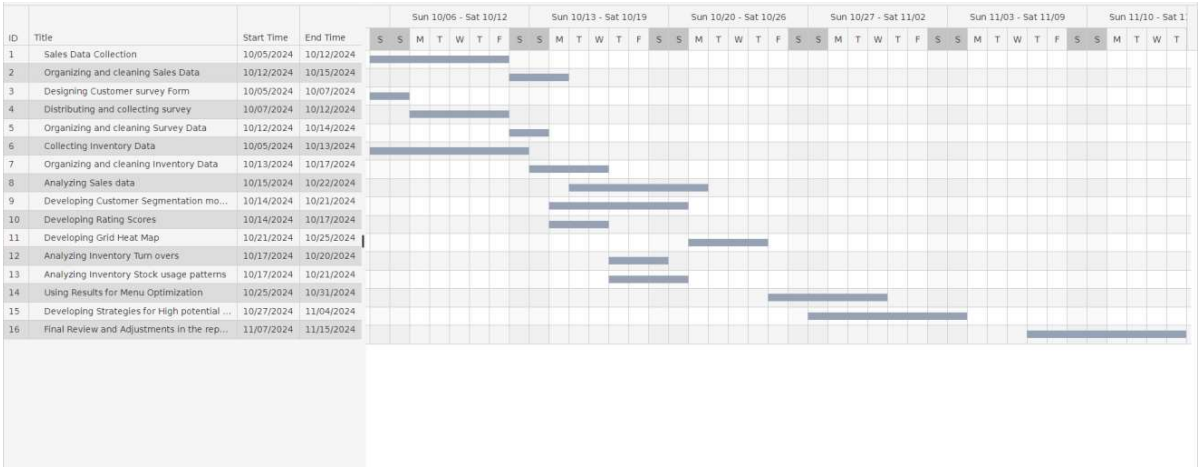



*Figure 1.2 as Illustrated above*

## *(2) Gantt Chart: -*

A Gantt chart has been constructed making sure all of the tasks involved in the project which have been specifically mentioned in the *work breakdown structure*. *Figure 1.3* provides a clear and concise Chart diagram for understanding the duration of each task and also the number of tasks that would be simultaneously performed in the total duration of the project.




| ID | Title | Start Time | End Time |
|---|---|---|---|
| 1 | Sales Data Collection | 10/05/2024 | 10/12/2024 |
| 2 | Organizing and cleaning Sales Data | 10/12/2024 | 10/15/2024 |
| 3 | Designing Customer survey Form | 10/05/2024 | 10/07/2024 |
| 4 | Distributing and collecting survey | 10/07/2024 | 10/12/2024 |
| 5 | Organizing and cleaning Survey Data | 10/12/2024 | 10/14/2024 |
| 6 | Collecting Inventory Data | 10/05/2024 | 10/13/2024 |
| 7 | Organizing and cleaning Inventory Data | 10/13/2024 | 10/17/2024 |
| 8 | Analyzing Sales data | 10/15/2024 | 10/22/2024 |
| 9 | Developing Customer Segmentation mo... | 10/14/2024 | 10/21/2024 |
| 10 | Developing Rating Scores | 10/14/2024 | 10/17/2024 |
| 11 | Developing Grid Heat Map | 10/21/2024 | 10/25/2024 |
| 12 | Analyzing Inventory Turn overs | 10/17/2024 | 10/20/2024 |
| 13 | Analyzing Inventory Stock usage patterns | 10/17/2024 | 10/21/2024 |
| 14 | Using Results for Menu Optimization | 10/25/2024 | 10/31/2024 |
| 15 | Developing Strategies for High potential ... | 10/27/2024 | 11/04/2024 |
| 16 | Final Review and Adjustments in the rep... | 11/07/2024 | 11/15/2024 |

*Figure 1.3 illustrates the Gantt chart as per the tasks in the project.*
*(zoom into the image for better clarity)*

Near the end of the month of November, the completion of this project can be expected, including refining all of the minor issues and readjustments to make the project robust and technically sound.
An excellent feature that stands out in the is project is the number of parallel tasks that can be performed. Almost three tasks can be performed at the same stipulated period of time which results in establishing good efficiency for the entirety of the project.
Each task has been given sufficient amount of time ensuring that there is no lack of data availability while performing data-driven analyses.

# EXPECTED OUTCOMES

The following are the expected outcomes of the project: -

*(1) Improved customer segmentation and targeting:*

By the end of this project, there will be a clear understanding in regard of customer loyalty. It would be easier to understand which household orders more and when do they particularly order, helping the restaurant in finding out the loyal customers and also helping the restaurant in finding out the customers who are very infrequent with their orders, which would definitely help the restaurant in better understanding the customer dynamics of Saket Bhu: Sattva.

*(2) Optimized menu items:*

By the end, the restaurant will have access to a more optimized menu which would be built by using all of the data-driven analyses performed. The optimized menu will focus both on the loyal customers, making sure that they keep ordering from the restaurant and would also help in establishing a new customer base as the infrequent customers would also be attracted towards the newer menu. Most popular items will be recognized and their prices will be scaled accordingly to yield maximum possible profits and also least popular items will also be scaled or merged with different items on the menu to attract customers to try out the newer items.

*(3) Efficient Inventory management*: -

By observing all of the stock-outs, stock-ups, sales data, and the segmentation model, a very efficient Inventory can be constructed making sure that most of resources that are brought are used and ensuring that the supplies are brought in such a way that would run exactly for the stipulated period of time without them getting exhausted before the given period of time or expiring because of the lack of sales. An efficient Inventory strategy can be constructed by using all of the vast data that had been collected over time.