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# Using Contribution of Menu Engineering in Upscale Restaurants to Enhance Sales Volume

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***Abstract*** *Few menu analysis techniques have been embraced so readily and institutionalized as quickly as menu engineering. Hotel Istana Nelayan is a 3-star hotel located in Tangerang City, Banten. Hotel Istana Nelayan has a restaurant with various menu variants on the ala carte menu of Krakatau Resto and Coffee Shop. This research aims to review the application of menu engineering analysis in increasing sales volume at the Istana Nelayan Hotel. The research method uses a qualitative approach using descriptive analysis with the menu engineering analysis method. This analysis uses the popularity index and contribution margin method. The study showed that the ala carte menu has four classifications: scilicet 8 Star, 5 Plowhorse, 4 Puzzle, and 2 Dog. Therefore, more detailed performance data has been provided regarding menu items. From the restaurant manager's perspective, this means that the analysis results can be served both short and long-term business goals.*

**Keywords** — *Istana Nelayan Hotel, Engieering Menu, Sales Volum*e

## I. INTRODUCTION

The tourism sector has now become one of the highest contributors to foreign exchange in Indonesia. It is known that in 2019, the tourism industry was recorded as the sector that provided the second-largest income in Indonesia. The wealth of natural and cultural resources is an essential component that is an attraction in tourism in Indonesia. In addition, tourism activities can also provide a multiplier effect or a double impact on the Indonesian economy, where the utilization and potential of tourism becomes an economic activity that can expand employment opportunities, encourage regional development, and introduce nature, culture, and national cultural values. In 2019, tourism activities directly absorbed around 10% of the total Indonesian workforce. Meanwhile, the accommodation and restaurant provision sector have contributed to absorbing 7% of the entire national workforce. (Sari et al., 2020)

Hotel accommodation is one of the critical aspects that can support the success of tourism. The Hotel is a commercially managed building that providing complete lodging facilities with food and drink services, rooms, and other supporting services (Akbar, 2017). Meanwhile, according to the Decree of the Minister of Tourism and Post No. KM 34/NK.103/MPPT 87, Hotel is a type of accommodation that uses the entire building area to provide lodging, dining, drinking, and all other types of services for the public, which are managed commercially (Darsono, 2011). The primary function of the Hotel is as a place of lodging or temporary rest for guests who come from various locations or who are on tour.

Along with tourism development in Indonesia, which has reached the international stage, economic growth in hotel accommodation is also overgrowing. It has been recorded that the number of accommodation providers in Indonesia is 29,243 buildings according to their respective classifications, ranging from city hotels, resorts, and star hotels, and 12 percent of them have been classified as star hotels. Each Hotel competes to provide suitable facilities and services for every guest. This can be seen from the star level and offers. According to the Banten Province Statistics Data, the number of hotel and restaurant accommodations at the end of 2018 in the Banten area has been recorded at around 2,275 buildings. (Dinas Pariwisata, 2018).

The restaurant is one of the essential parts that must be owned in a hotel business, where a restaurant is a place for providing food and beverage services; this is in line with the human need for food for human survival. In the business world, the restaurant earns a profit or profit through the food and beverage products offered to every customer, both coming from outside the Hotel and staying at the Hotel. According to (BPS, 2021) the number of visits to restaurants in the Tangerang area in 2021 has increased by up to 20% from the previous year, 80%. To make a continuous profit, the products offered in the restaurant must have a delicious taste and an attractive appearance and quality. Each restaurant has a list of choices of types of food and drinks provided to customers in the form of a menu. Managing food service operations to achieve a specific food cost percentage has long been a fundamental principle of the restaurant business (Lebruto et al., 1997). Menu engineering has been widely reported and discussed in the hospitality literature and has been frequently adopted as an integral part of the foodservice curriculum in hospitality education worldwide (Morrison et al., 1996). The primary purpose of the menu is to sell the products offered by the restaurant, and the menu is the restaurant's most important sales tool, the establishment's business card. Its primary role is to inform. It should have an appropriate graphic design and layout, meeting customers' expectations both in terms of the food offered and format, color, and organization (Barreto, 2010). Customers subconsciously evaluate the menu and base their first impressions of the restaurant on this assessment (Barreto, 2010; Teichmann, 2009). Study Linassi (2016) stated that revealed slight differences in the rankings between the traditional approach and ABC/ME, demonstrating that the integration of ABC with ME made it possible to identify increased food-costs and lower CMs for all groups menu items.

The results also show that ABC methods apply to an oriental-style restaurant. The menu is a list of choices of various foods and drinks offered in restaurants. It is usually accompanied by a visualization of the types of food and beverages and prices and a brief description of the food or drinks offered. The menu has an essential role in a restaurant or other food business where through the menu, customers can find out what products are being sold. Hotel Palace Nelayan is one of the five-star hotels in the Tangerang, Banten area, a restaurant with various menu variants, both domestic and international. Hotel Istana Nelayan has restaurant facilities under the name Krakatau Resto and Coffee Shop. Krakatau Resto and Coffee Shop offer various menu variants ranging from western food, Chinese food, and Indonesian food for breakfast, lunch, and dinner. Each of these food menus has a significant influence on the rise and fall of hotel income. In total sales volume of Krakatau Resto and Coffe Shop, Hotel Istana Nelayan in 2021 for the January-April period experienced an increase in sales of a la carte menus; this is also supported by data on visits to customers to Krakatau Resto and Coffe Shop, which also increased by 17 % from the previous year, namely in the July-December 2020 period by 56%, and in the January-April 2021 period by 73%.

However, when viewed from the sales volume per item from the menu, it is not stable, and some even experience a decrease every month. This affects the turnover obtained by the Hotel experiencing fluctuations (instability). If the situation continues to occur, it will affect the volume of sales, which can impact the losses experienced by the company. Sales volume itself is the number of product units sold by a company (Hanifaradiz & Satrio, 2016). The higher the number of sales generated by the company, the higher the possibility of profit generated by the company and vice versa. This is what causes the importance of evaluating sales volume so that the company does not suffer losses. To overcome the decline in sales volume, the company needs to implement a menu evaluation that can be done by calculating using the engineering menu. Menu engineering is a step that can evaluate a decision related to price and menu design in the present and in the future (Nenimeler, 2013). In the engineering menu analysis, there are four assessment categories including Star (products sold are popular and profitable), PlowHorse (products sold are popular but not profitable), Puzzle (products sold are profitable but not popular), and Dog (products sold are unpopular and unprofitable). Unfavorable).

According to Kasavana (1988), two essential elements are the focus of attention in this analysis, namely:

Menu Mix (MM) is an analysis of customer demand or an analysis of the popularity index of each type of food which is calculated to see the popularity of each item on the menu. To get the popularity index, it is necessary to calculate the number of menu items sold compared to all existing menu items. An item in the menu can be said to be popular if the menu item's sales are equal to 70% of the targeted sales amount. Menu mix% is obtained from calculating the number of menu items sold with the total sales of all menu items in a menu group multiplied by 100. Comparing the menu mix% of each menu item with the menu popularity index in similar groups shows the menu's popularity. Contribution Margin (CM) analyzes the contribution margin calculated to determine each item's profit contribution in the menu. The contribution margin is the selling price less the cost of menu items. By calculating the contribution margin, it is known the gross profit of each menu item. The average contribution margin results from dividing the total contribution margin by the total menu items sold in the same menu group.

By comparing the contribution margin of each menu item with the average contribution margin of the menu in

the same group, the menu item's profit contribution can be seen.
If the profit contribution and the popularity of the menu have been investigated, then each menu item can be classified according to its group

**Table 1 Menu Classification**

| MM% CATEGORIES | CM CATEGORIES | CLASSIFICATION |
|---|---|---|
| High | High | Star |
| High | Low | Plowhorse |
| Low | High | Puzzle |
| Low | Low | Dog |

Source: Kasavana and Smith (1990)

The two elements above are obtained from three data sources, namely:
a) Sales History to get Menu Mix data
b) Standard Recipe to get Food Cost data
c) Menu List to get Selling Price data

The usual strategy in preparing menu prices is based on costs and mark-ups of these costs. This can be an obstacle in maximizing profits and income (Ardiansyah & Magdalena, 2018). In carrying out menu engineering, it is necessary to have a serving operator familiar with the cost of menu ingredients, selling prices, and quantities sold over several periods. Because in the analysis of each menu ingredient is classified and evaluated the success of marketing and preparation of prices. The purpose of menu engineering analysis itself is to maximize sales and profits so that the business can develop well. The study can be done manually or using a computer system. From the analysis results, it can be seen which menus can benefit the company and should be maintained, which menus need to be rearranged, which menus need to be repositioned and which menus need to be replaced or removed. Thus it can be concluded that the Menu Engineering method is one of the strategies or appropriate methods to be used in finding answers and solutions to the problem of implementing menus in restaurants.

## II. LITERATURE REVIEW

The definition of Menu engineering was first introduced by Michael L. Kasavana and Donald I. Smith in 1982 in a book entitled "A Practical Guide to Menu Analysis." This method is a form of quantitative calculation that is the basis for analyzing the success of the menu both in terms of attracting consumer interest and profit (Sakinah, 2019). Through their book, Kasavana and Smith offer an approach that analyzes each menu item from the perspective of contribution margin and sales volume for menu prices. The contribution margin is the difference between the selling price and the direct costs of a particular menu item. Items with high contribution margin and sales volume are called "Star"; items with low contribution margin and low popularity are called "Dog," while the other menu item categories are "Plowhorse" and "Puzzle." (Kang et al., 2010)

In the concept of menu engineering, classifying a menu item into a category is seen based on the level of popularity and benefits of each menu. The purpose of this classification is to avoid mistakes in making decisions about the good or bad of a food menu (Harahap, 2013).

Some things that need to be known before conducting an engineering menu analysis include the food cost (cost of each menu item), selling price (selling price), and also the total amount sold (total sales).

According to Wiyasha in (Fitri 2018), food cost estimates the cost of food ingredients needed to make one serving of a food menu, charged to the cost of goods. Apart from the cost of raw materials issued by hotels or restaurants, selling prices are also calculated from overhead costs, labor, and operational costs.

The types of costs, according to Firmansyah in (Wauran, 2016) are as follows: production and non-production costs, raw material costs, labor costs, overhead costs, marketing costs, general and administrative costs, variable costs, semi and fixed

The ideal standard cost percentage is 35% - 40% of sales. By knowing the cost of food, the selling price or selling price of a menu item can be determined based on a predetermined standard cost percentage using the formula:

$$Selling\ Price = \frac{Food\ Cost}{Standard\ cost\ percentage}$$

After knowing each menu item's cost and selling price, the next step that needs to be done in the engineering menu analysis is to analyze the profit or contribution margin of the menu and the popularity index. After getting the results of the two analyzes, then enter the final stage, namely menu classification (Ojugo, 2010).
Menu profit analysis needs to be done by calculating the contribution margin by calculating the selling price of the menu item minus the cost of the menu item. The contribution margin itself is the difference between the selling price and the cost of menu items used to cover costs such as overhead, salary, operational costs, employee costs, and other costs (Fatmawati, 2011). The contribution margin calculation formula is formulated as follows:

$$Contribution\ Margin(CM) = Selling\ Price - Cost$$

After getting the calculation results from the contribution margin (CM), the next step that needs to be done is to calculate the total CM, namely the number of sales for each menu multiplied by the contribution margin of each menu item. The next step is to calculate the contribution margin percentage. Each contribution margin of each menu item is divided by the total menu contribution margin multiplied by 100%.

$$Total\ CM = Number\ of\ Sold \times Contribution\ Margin$$

$$CM\% = \frac{CM}{Total\ CM} \times 100\%$$

After getting the Total CM and CM% values, the next step is to find the average contribution margin, namely the total contribution margin of each menu item divided by the total number of items in the menu sold.

$$Avarage\ CM = \frac{Total\ CM}{Total\ Number\ of\ Sold}$$

After getting the average contribution margin, the next step compares the total contribution margin (CM) of each menu item with the average contribution margin. The comparison is carried out to determine the ability of each menu item to provide benefits. If the CM value of an item is higher than the average contribution margin, then the item is included in the "HIGH" category; otherwise, if the CM value of an object is lower than the average contribution margin, then the item is included in the "LOW" category. The higher the contribution margin obtained, the higher the available funds to cover the costs incurred, and the more net profit.

The first step that needs to be done to analyze the popularity level of a menu item is to know in advance its popularity index (IP). A menu item can be said to be popular if the sales of the menu are equal to 70% of the targeted sales (Nenimeler, 2013). The formula for determining the popularity index is:

$$Popularity\ index = \frac{100}{Number\ of\ item\ menu} \times 70\%$$

Next is to determine the percentage of popularity or menu mix%, namely the number sold divided by the total number sold and then multiplied by 100%. The potential food cost itself is obtained by the cost of the menu item multiplied by the number of sales of each menu item. The formula for calculating the potential food cost and menu mix% is formulated as follows:

$$Menu\ mix\ \% = \frac{Number\ of\ Sold}{Total\ Number\ of\ Sold} \times 100\%$$

After getting the value from the popularity index and the mix% menu, the next step is to compare the two. If the menu mix% value is higher than the popularity index, the menu item is in the "HIGH" category. Otherwise, if the mix% menu value is lower than the popularity index, the menu item is in the "LOW" category.
To evaluate the benefits and popularity of a menu item, it is necessary to categorize it based on each menu item's MM category and CM category. After the results of the two values are found, the last stage of the engineering menu analysis is to determine the classification of each item found by comparing the category results from MM% and CM. By looking at each existing menu item, the company or organization can follow up on the menu. The classifications are Dog (MM% and CM low), Puzzle (MM% low, CM high), Plowhorse (MM% high, CM low), Star (MM% and CM high).

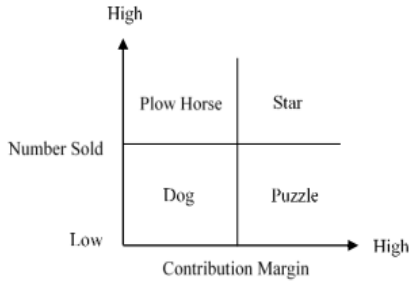


**Figure 1. Menu Classification**

The explanation of the four classifications above, according to Kasavana and Smitt in (Taylor & Brown, 2007), is as follows:
1. Star: Menu that has a high level of popularity and profit.
2. Plowhorse: The menu is trendy, but the rate of profit is low.
3. Puzzle: Menus that have high profits but low levels of popularity.
4. Dog: Menu that has a low level of popularity and profit.

By knowing the classification of each menu item, the next step that needs to be done is to determine the decision on each menu item based on its type. The findings based on the classification according to several methods are as follows:

**Table 2 Actions based on menu classification**

| Model | Author | Corresponding Quadrant | | | |
|---|---|---|---|---|---|
| Menu Analysis | Miller | Winners | Marginals II | Marginals III | Losers |
| Menu Engineering | Kasavana and Smith | Stars | Plowhorses | Puzzles | Dogs |
| Cost/Margin Analysis | Pavesic | Primes | Standards | Sleepers | Problems |
| **Decisions(s)** | | | | | |
| Option 1 | | Keep menu item as is | Reduce costs by retooling recipe | Promote menu item by advertising and/or menu placement | Delete menu item |
| Option 2 | | | Increase price | Decrease price | |
| Option 3 | | | Do nothing | Do nothing | |
| Option 4 | | | Delete menu item | Delete menu item | |

Source: (Taylor & Brown, 2007)

From the table above, the steps or actions that need to be taken by a restaurant according to their respective classifications are on the menu with the Star classification, while maintaining the menu, with the Plowhorse classification, reducing costs by completing the recipe and increasing the price of the menu, for the menu with Puzzles classification is to re-propose menu items through advertisements or do menu placements, lower menu prices and finally on menus with Dog classification all that needs to be done is to remove the menu from the list because it is not at all profitable and also not in demand by consumers and replaces it with a menu others are more popular and profitable. By knowing the classification of each menu item, the next step that needs to be done is to determine the decision on each menu item based on its category. For menus with a Star classification, it is to maintain the menu, on a menu with a Plowhorse classification, it is to reduce costs by re-equipping recipes and increasing menu prices; for a menu with a Puzzles classification, it is to re-propose menu items through advertisements or do menu placements, lower menu prices and Finally, on the menu with the Dog classification, all that needs to be done is to remove the menu from the list because it is not at all profitable and also not in demand by consumers and replaces it with another menu that is more popular and profitable..

To increase the volume of menu sales, the critical thing needed by the management is to improve the marketing system by using a SWOT analysis system, which deals with opportunities that the company can utilize to develop its business. SWOT analysis is one of the weapons used by companies or organizations to face global competition both at national and international levels; besides that, this analysis also functions as decision making. The SWOT analysis process is carried out by conducting an internal survey regarding Strengths and Weaknesses and running an external survey, namely Opportunities, and Treats (Dwi Fatimah, 2016).

Meanwhile, according to Rangkuti (Pratiwi, 2019), SWOT analysis is the systematic identification of various factors to formulate company strategy. This analysis is based on a logic that can maximize strengths and opportunities. but simultaneously can minimize weaknesses and threats

From the two definitions above, it can be concluded that SWOT analysis is one of the methods used by companies or organizations in building a business to determine the level of success by analyzing strengths, weaknesses, opportunities, and threats. In this engineering menu analysis, a SWOT analysis is carried out on the menu classification results from comparing MM and CM menus. This is done to find out the strengths, weaknesses, opportunities, and threats in each category or menu classification. Carry out promotions so that they can attract the attention of customers to get to know the cafe concept which is a fairly new and unique concept in Indonesia. Maintaining the promised quality, for example by continuing to use organic vegetables and fruits on all menus (Carroline, 2020). Study (Juliana et al., 2020) stated that An environment that is able to form hunger and increase appetite in humans is absolutely necessary in the interior design of a restaurant.Many researcher (Djakasaputra et al., 2021; Djakasaputra et al., 2018; Juliana et al., 2021; Pramezwary et al., 2021; Juliana et al., 2021; Juliana et al., 2020; Juliana, 2019; Juliana & Noval, 2020; Pramezwary et al., 2021; Pramezwary et al., 2021; Pramezwary & Salim, 2021; Stella et al., 2021) stated that a good service system and good servicescape support will increase sales of food products and increase customer satisfaction and repurchase. Trust in a restaurant will also improve purchasing decisions (Widianti & Wijaya, 2021)

## III.METHOD

This study uses a qualitative method using descriptive analysis with an engineering menu analysis method approach. The qualitative method is a research procedure that produces descriptive data in spoken words from people or observed behavior. (Creswell, 2014) This approach is directed at the background and the individual holistically. The qualitative descriptive method was chosen as the research method because the researcher wanted to emphasize the meaning and to reveal the actual data, not to generalize. The research was conducted through contribution margin analysis, popularity index analysis, menu classification, and SWOT analysis. The author collects primary data from unstructured interviews and observations and sales data from Krakatau Resto and Coffee Shop, Istana Nelayan Hotel, and collects secondary data from the literature. This study adopts the menu engineering model proposed by Kasavana and Smith, a classification of menu items in four quadrants formed from a 2x2 matrix, low and high popularity with contribution margins below average and above average (Kasavana et al. al, 1990).

## IV.RESULT AND DISCUSSION

To increase the sales volume that had declined, Hotel Istana Nelayan's efforts are to apply engineering menus to every menu sold at its restaurant, namely Krakatau Resto and Coffee Shop. This was done because of the restaurant's decreasing sales volume and considering that Krakatau restaurants and coffee shops have many different menu variants, resulting in the stock of food supplies for some of the unsold menus having to be unused. By looking at the existing problems, the Hotel finally had to reduce some of their a la carte menu variants and set aside menus that could be sold. However, this is still considered ineffective in increasing sales volume in restaurants. This is supported by Krakatau Resto and Coffee Shop sales data from January to April, which was unstable or experienced ups and downs. Then the name engineering menu is applied to see how much potential a menu item has to increase sales volume judged by the level of popularity and profits.
Seeing the problems, the authors agree to choose the engineering menu as the main topic for which an analytical review will be carried out on its application at the Krakatau Resto and Coffee Shop, Istana Nelayan Hotel. The author's analysis of the engineering menu is by using a computer system or using Microsoft Excel. In analyzing the problem, the sales data used by the author in conducting this review is the sales data for the Ala carte Krakatau Resto and Coffee Shop menu for 2021 starting from January-April.
As explained in the theoretical basis above, before conducting an engineering menu analysis, the main thing that needs to be known in advance is the food cost (cost of goods) of each menu item and the selling price (selling price). The cost calculation is calculated from the cost recipe, garnish and supplementary costs, labor costs, overhead, operations, and administration. An example of the analysis as well as determining the selling price of a menu item at Krakatau Resto and Coffee Shop, Hotel Istana Nelayan are as follows:

**Table 3 Example of calculating menu prices at Krakatau Resto and Coffee Shop, Istana Nelayan Hotel**

| | IKAN KUWE BAKAR | | | | |
|---|---|---|---|---|---|
| 1 EKOR | IKAN KUE | 900 | GR | 60.00 | 54,000.00 |
| | BUMBU KECAP | 50 | GR | 33.52 | 1,676.23 |
| | BUMBU KUNING | 20 | GR | 28.18 | 563.64 |
| | BUMBU SAUCE | 50 | GR | 15.94 | 797.08 |
| | SEASONING IKAN | 1 | EKOR | 1,539.17 | 1,539.17 |
| | JERUK LIMO | 5 | GR | 25.00 | 125.00 |
| | COST | | | | 58,701.11 |
| | EXTRA COST | | | | 5,870.11 |
| | TOTAL COST | | | | 64,571.22 |
| | SELLING PRICE | | | | 200,000.00 |
| | % FOOD COST | | | | 32.29% |

Seen from the table above, the selling price calculation is the total cost divided by the standard cost percentage per menu item. The typical cost percentage used at Krakatau Resto and Coffee Shop, Istana Nelayan Hotel is a maximum of 40%.

Next is to determine the menu popularity index. A menu item can be classified as popular if the sales of the menu have met at least more than 70% of the targeted sales amount. The popularity index itself is obtained by dividing the total number of menu items by 100 and multiplying by 70% of the sales target. On the a la carte menu of Krakatau Resto and Coffee Shop, there are 19 menu items, so if the calculation is carried out, the results of the IP or popularity index of the ala carte menu are as follows:

$$Popularity\ index = \frac{100}{Number\ of\ item\ menu} \times 70\%$$

$$\frac{100}{19} \times 70\%$$

$$= 3{,}68\ \%$$

To determine the level of popularity of a menu in this analysis, the value of the menu popularity index will be compared with the results of the mix menu from this engineering menu analysis; if the mix menu value is higher, then the menu will enter the "HIGH" category and vice versa if the mix menu value is higher lower than the popularity index then the menu is included in the "LOW" level category. In addition to knowing the popularity level category of menu items, knowing the profit level category is also essential in menu engineering analysis, namely by comparing the total contribution margin and its average value.
The following is the result of the menu engineering analysis carried out by the author from the data obtained at the Krakatau Resto and Coffee Shop, Istana Nelayan Hotel, for the period January-April 2021

**Table 4. The results of the analysis of the engineering menu of Krakatau Resto and Coffee Shop, Hotel Istana Nelayan**

| Menu Item | Food Cost per Portion | COST | Selling Price | Total Amount Sold | CM (Rp) | % CM | Food Cost (%) | Sales (%) | Potential Food Cost (Rp) | Potential Food Cost (%) | Total Food Sales (Rp) | total CM (Rp) | MENU MIX (%) | MM Category | CM Category | Menu Category |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Ikan Kuwe Bakar | 64,571.22 | 200,000.00 | 45 | 135,428.78 | 73.5% | 32.3% | 106% | 2,905,705 | 32% | 9,000,000 | 184173.318 | 1.36 | Low | High | Puzzle |
| 2 | Ikan Gurame Asam Manis | 43,457.89 | 126,000.00 | 138 | 82,542.11 | 24.0% | 34.5% | 58% | 5,997,189 | 34% | 17,388,000 | 344237.267 | 4.17 | High | High | Star |
| 3 | Ikan Gurame Goreng | 39,313.08 | 119,000.00 | 53 | 79,686.92 | 62.4% | 33.0% | 95% | 2,083,593 | 33% | 6,307,000 | 127633.93 | 1.60 | Low | Low | Dog |
| 4 | Ikan Gurame Saos Belacan | 40,473.13 | 126,000.00 | 28 | 85,526.87 | 118.2% | 32.1% | 150% | 1,133,248 | 32% | 3,528,000 | 72370.8782 | 0.85 | Low | High | Puzzle |
| 5 | Patin Tim Taucho | 34,510.29 | 105,000.00 | 75 | 70,489.71 | 44.1% | 32.9% | 77% | 2,588,272 | 33% | 7,875,000 | 159768.155 | 2.27 | Low | High | Puzzle |
| 6 | Sate Ayam | 15,822.14 | 42,000.00 | 140 | 26,177.86 | 23.6% | 37.7% | 61% | 2,215,100 | 38% | 5,880,000 | 110755.527 | 4.23 | High | Low | Plow Horse |
| 7 | Sop Buntut | 50,670.00 | 130,000.00 | 559 | 79,330.00 | 5.9% | 39.0% | 45% | 28,324,530 | 39% | 72,670,000 | 1340147.17 | 16.89 | High | Low | Plow Horse |
| 8 | Cumi Goreng Tepung | 23,589.86 | 65,000.00 | 174 | 41,410.14 | 19.0% | 36.3% | 55% | 4,104,636 | 36% | 11,310,000 | 217750.51 | 5.26 | High | High | Star |
| 9 | Udang Telor Asin | 31,779.35 | 90,000.00 | 79 | 58,220.65 | 41.9% | 35.3% | 77% | 2,510,569 | 35% | 7,110,000 | 138997.623 | 2.39 | Low | Low | Dog |
| 10 | Udang Mayonaise | 28,488.21 | 90,000.00 | 89 | 61,511.79 | 37.2% | 31.7% | 69% | 2,535,451 | 32% | 8,010,000 | 165444.222 | 2.69 | Low | High | Puzzle |
| 11 | Ayam Goreng Singapore | 53,651.76 | 140,000.00 | 190 | 86,348.24 | 17.4% | 38.3% | 56% | 10,193,834 | 38% | 26,600,000 | 495804.34 | 5.74 | High | High | Star |
| 12 | Ayam Goreng Mentega | 16,017.88 | 45,000.00 | 169 | 28,982.12 | 19.6% | 35.6% | 55% | 2,707,022 | 36% | 7,605,000 | 148019.894 | 5.11 | High | Low | Plow Horse |
| 13 | Sapo Tahu Seafood | 20,743.71 | 65,000.00 | 209 | 44,256.29 | 15.8% | 31.9% | 48% | 4,335,435 | 32% | 13,585,000 | 279527.489 | 6.32 | High | High | Star |
| 14 | Cap Cay | 13,077.16 | 48,000.00 | 248 | 34,922.84 | 13.3% | 27.2% | 41% | 3,243,136 | 27% | 11,904,000 | 261736.607 | 7.49 | High | High | Star |
| 15 | Kangkung Hot Plate Seafood | 13,421.72 | 40,000.00 | 134 | 26,578.28 | 24.7% | 33.6% | 58% | 1,798,510 | 34% | 5,360,000 | 107630.387 | 4.05 | High | Low | Plow Horse |
| 16 | Gado-gado / Karedok | 6,991.41 | 35,000.00 | 154 | 28,008.59 | 21.5% | 20.0% | 41% | 1,076,677 | 20% | 5,390,000 | 130351.25 | 4.65 | High | Low | Plow Horse |
| 17 | Mie Goreng Seafood | 13,616.47 | 47,000.00 | 155 | 33,383.53 | 21.3% | 29.0% | 50% | 2,110,553 | 29% | 7,285,000 | 156374.952 | 4.68 | High | High | Star |
| 18 | Nasi Goreng Seafood | 13,142.04 | 47,000.00 | 455 | 33,857.96 | 7.3% | 28.0% | 35% | 5,979,628 | 28% | 21,385,000 | 465559.74 | 13.75 | High | High | Star |
| 19 | Tahu Kipas | 11,315.67 | 40,000.00 | 215 | 28,684.33 | 15.4% | 28.3% | 44% | 2,432,869 | 28% | 8,600,000 | 186374.462 | 6.50 | High | High | Star |
| | | | | 3309 | | | | | 88,275,956 | | 256,792,000 | 5092657.73 | 100.00 | | | |
| | | IP = | 3.684210526 | | | | | | | | | | | | | |
| | | Avarage CM = | 1539.032253 | | | | | | | | | | | | | |

Source: Analyze Data (2021)

From the results of the menu engineering analysis, it is known that the profit contribution level (CM Category), popularity level (MM Category), and the classification of each Ala carte menu item from Krakatau Resto and Coffee Shop are as follows:
a. Profit contribution rate (CM Category)

From the results of the contribution margin analysis above, it is known that 12 menu items fall into the "HIGH" category, namely grilled kuwe fish, sweet and sour carp, fish with belacan sauce, catfish taucho team, fried squid flour, shrimp mayonnaise, fried chicken Singapore, Sapo tofu seafood, cap cay, seafood fried noodles, seafood fried rice, tofu fan. At the same time, the menu items that fall into the 'LOW' category are seven menu items: fried carp, chicken satay, oxtail soup, salted egg prawns, butter fried chicken, kangkung hot plate seafood, and karedok/Gado-gado.

b. Menu popularity level (MM Category)

From the analysis of the mix% menu, it is known that 13 menu items fall into the "HIGH" category, namely sweet and sour carp, chicken satay, oxtail soup, flour fried squid, Singapore fried chicken, butter fried chicken, seafood tofu sapo, cap cay, kangkung. Seafood hot plate, karedok/gado-gado, seafood fried noodles, seafood fried rice and tofu fan. At the same time, the menu items that fall into the "LOW" category are six menu items, namely grilled kuwe fish, fried carp, fish carp in belacan sauce, catfish taucho team, salted egg shrimp and finally shrimp mayonnaise.

c. Menu classification

From the analysis of the contribution margin and menu mix, there are four types of menu classification based on the category of each menu item. There are 8 menu items with the "STAR" classification with a percentage of 42% (sweet and sour carp, fried squid flour, Singapore fried chicken, seafood tofu sapo, cap cay, seafood fried noodles, seafood fried rice, and fan tofu), 5 items menu with the "PLOW HORSE" classification with a percentage of 26% (chicken satay, oxtail soup, butter fried chicken, kangkung hot plate seafood, gado-gado/karedok), 4 menu items with the classification "PUZZLE," patin tim taucho, shrimp mayonnaise) and two menu items with the category "DOG" with a percentage of 11% (fried carp and salted egg shrimp).

This analysis is assessed based on the results of menu classification from menu engineering analysis, which from the analysis results on the Ala carte menu list Krakatau Resto and Coffee Shop there are eight menu items with STAR classification, five menus with PLOWHORSE classification, four menu items with PUZZLE classification and two items menu with DOG classification.

Strength

a. Star: the menu offered is popular and profitable

b. Plowhorse: popular menu offered

c. Puzzle: the menu offered is profitable

Weakness

d. Plowhorse: the menu offered is not profitable, the food cost is high, it does not use standard portions, and the menu control is weak.

e. Puzzle: the menu offered is less popular or less desirable, the price is too high, the raw materials are less popular, and the taste is less attractive.

f. Dog: the menu offered is not famous and also unprofitable, the quality of taste and ingredients is low, the control system is weak, and the taste of the food is not good.

Opportunity

g. Star: Maintain menu consistency, place menus in strategic positions, and increase prices if there is an opportunity.

h. Plowhorse: improve food control systems, set menu portion standards consistently, reset menu prices.

i. Puzzle: discounting the menu, lowering the menu's selling price, and doing marketing on the menu.

j. Dog: delete the menu and replace it with a more popular and profitable menu, improve the menu quality, carry out menu promotions and provide discounts or lower the selling price of the menu.

Threat

k. Star: There are five-star hotels and restaurants in the same area, so if there is a lack of control over the menu and the lack of consistency in the menu, it will decline.

l. Plowhorse: There are five-star hotels and restaurants in the same area, as well as the same type of menu offered by other competitors at lower and popular prices

m. Puzzle: the menu of the same type is offered by other competitors at a cheaper and more popular price

n. Dog: a menu of the same type offered by other competitors at a lower and more popular price

From the existing problems and the results of the engineering menu analysis that has been carried out, recommendations for improvement that can be given to Krakatau Resto and Coffee Shop, Istana Nelayan Hotel based on the engineering menu theory from (Kasavana 1988) are:

**Star**

From the results of the a la carte menu analysis that has been carried out, the star classification menu item is the most out of the three types of classifications, namely eight menu items. This is considered quite good for companies where the products sold are popular and profitable, and of course, this will be able to increase sales volume, and the follow-up that needs to be done from this classification are: Maintaining the quality of quantity and presentation Placing the menu in a place that is easy to see or place on the main list, Set the specified price elasticity

**Plow Horse**

From the results of the analysis, there are 5 menu items with a plow horse classification where the products sold are popular but less profitable. Actions that need to be taken from menus with plowhorse categories or classifications are: Increasing the selling price on the menu, The position of the less menu must be adjusted to the others, Combining the plowhorse menu with a menu that has low food costs so as to increase CM, Considering reducing portions of the menu .Puzzle

From the analysis results, there are four menu items with a puzzle classification where the products sold are profitable but less popular. Actions that need to be taken on menus with this classification are: Removing menus, especially those with low sales, Lowering food prices, Placing menus in strategic positions and promoting menus, Limiting the number of puzzles in the menu because it will affect customer demand, Changing the name of the food to affect its popularity level.

***Dog***

From the results of the analysis, the menu with this last category is the least compared to the others, namely as many as 2 menu items that are not popular and also not profitable. So the actions that need to be taken on this classification or category are: Removing the dog category from the menu, Replacing the dog menu with a menu that has greater demand and profit, or taking actions as has been implemented by the Istana Nelayan Hotel, namely the menu is only provided if there is a special request.

By following up according to the classification of their respective menus, it is hoped that Krakatau Resto and Coffee Shop, Istana Nelayan Hotel can again increase its sales volume.

## V. CONCLUSION

Based on the results of the data analysis of the Review of the Application of Engineering Menus in Increasing Sales Volume at the Istana Nelayan Hotel, the following conclusions were obtained: based on the results of the contribution margin analysis of each Ala carte menu in Krakatau Resto and Coffee Shop, Istana Nelayan Hotel, it can be concluded that from 19 menus contain 12 items or 63% are included in the category with high contribution margin. Meanwhile, seven things, or 37%, fall into the class with a low contribution margin. Based on the analysis of the popularity index of each Ala carte menu at Krakatau Resto and Coffee Shop, Hotel Istana Nelayaan, it can be concluded that of the 19 menus, there are 13 items or 68% included in the list. Categories that have a high popularity index. Meanwhile, about 32% of, six things fall into the type that has a low popularity index.

From the results of the engineering menu analysis on the Ala carte menu list at Krakatau Resto and Coffee Shop Hotel Istana Nelayan, there are four classifications or categories from the analysis menu, namely eight menu items with the "STAR" classification, five menu items with the "PLOW HORSE" classification, four menu item with "PUZZLE" classification and two menu items with "DOG" classification.

By applying the follow-up to the results of the analysis following the Menu engineering model theory, which is to find a solution for the menu with the classification of Plow Horse, Puzzle and Dog, it is expected to increase sales volume again at Krakatau Resto and Coffee Shop, Hotel Istana Nelayan.

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