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Utilization of Fibonacci Algorithm to Determine Product Bundling Discounts in Culinary Business

M. Fauzan Aziman[1], Tata Sutabri[2],
[1,2]Magister of Informatics Engineering, Universitas Bina Darma, Indonesia
Email: mfaziman03@gmail.com[1], tata.sutabri@gmail.com[2]

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ABSTRACT
Micro, small, and medium-scale culinary businesses (MSMEs) often face challenges in determining product bundling discount strategies due to limitations in data analysis. This study examines the effectiveness of implementing the Fibonacci algorithm in determining food product bundling discounts to increase sales and profitability. The method used is a quantitative experiment with an algorithm simulation approach, where discounts are determined based on the Fibonacci number sequence (1%, 2%, 3%, 5%, 8%, etc.). Data were obtained from the Lumpia Beef Lumer culinary MSME in Bekasi Regency and analyzed using Python, while the results were visualized in a soft Excel document. A comparison graph of the number of sales and income before and after the application of discounts was compiled in Excel based on daily transaction data. The results show an increase in sales volume of 60% and gross income of 60% after this strategy was implemented. The tiered discount strategy based on Fibonacci has proven attractive to customers, encouraging bundling purchases without significantly reducing profit margins. This approach offers a systematic and adaptive data-driven solution and can be used by other MSMEs to develop more effective and sustainable marketing strategies.

Corresponding Author:
M. Fauzan Aziman,
Magister of Informatics Engineering,
Universitas Bina Darma, Indonesia
Email: mfaziman03@gmail.com

1. INTRODUCTION

Indonesia's food and beverage industry has increased from 2020 to 2021 by 2.54% to IDR 775.1 trillion. The Central Statistics Agency (BPS) reported that the gross domestic product (GDP) of the national food and beverage industry at current prices (ADHB) was IDR 1.12 quadrillion in 2021. This value accounts for 38.05% of the non-oil and gas processing industry or 6.61% of the national GDP, reaching IDR 16.97 quadrillion [1]. Culinary business actors must use various effective marketing strategies to remain competitive. The product bundling strategy, where several products are sold in one package at a more attractive price than if purchased separately, is a standard marketing technique in the culinary business. This strategy benefits customers and encourages product sales [2]. In addition, this strategy can create a higher perception of value for consumers, thus enabling them to make larger purchases.

MSMEs often face limited resources when designing effective and adaptive marketing strategies [3]. While digitalization offers excellent opportunities for MSMEs, they face challenges such as budget constraints, lack of analytical skills, and poor data quality. This hampers their ability to make the most of data-driven marketing [4]. MSMEs often struggle to determine the ideal bundling and discount schemes due to limitations in data analysis and data-driven decision-making [5]. pplying algorithms in digital marketing can help business actors understand consumer behaviour and optimize their marketing strategies [6].

The Fibonacci method produces a series of numbers where each is the sum of the previous two numbers, starting with zero and one [7]. This pattern makes a ratio similar to the golden ratio, which in some situations is considered attractive and aesthetic [8]. In determining product bundling discounts, a gradual approach such as the Fibonacci pattern can create a more varied and attractive pricing scheme for customers and help business owners manage profit

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margins.

Research related to marketing strategy optimization with a computational approach has been conducted but is still limited to the context of large businesses [9]. With a data-based approach, this study will assess how effective the Fibonacci bundling strategy is in increasing the sales and profitability of a culinary business. The implementation of this strategy will be evaluated by validating sales results by looking at sales data before and after applying the Fibonacci algorithm to determine whether the method used can be helpful in culinary businesses.

Several previous studies have examined the use of algorithms in formulating packaging and pricing strategies. For example, a study that applied the Apriori algorithm to design product discount packages showed that this algorithm can group goods and set discount values automatically without the management's intervention [10]. In addition, other studies use the FP-Growth algorithm to understand consumer shopping behaviour, which can be used to design more efficient product packaging [11]. The selection of the Fibonacci algorithm in this study was based on considerations of simplicity, effectiveness, and suitability to the needs of culinary MSMEs with limited resources and technology. Compared to other algorithms, such as Apriori or FP-Growth, which require complex data processing and high technical understanding, the Fibonacci algorithm is lighter and easier to understand. It can be implemented without sophisticated system infrastructure. The Fibonacci series also produces a logical and psychologically attractive tiered discount pattern for consumers, where discounts increase slowly as the number of products purchased increases. In addition, with a series growth that is not too aggressive, Fibonacci allows discount control to remain rational to maintain profit margins.

Therefore, this algorithm is the most suitable for creating a systematic, adaptive discount strategy that other MSMEs can easily replicate. Although applying the Fibonacci algorithm in determining product bundling discounts is still limited, its potential to create attractive discount schemes with a systematic approach deserves more attention. This study aims to use the Fibonacci algorithm to determine discounts for product packages in the culinary business.

2. RESEARCH METHOD

This study was conducted to assist culinary MSME actors in determining bundling discount prices to optimize sales using the Fibonacci algorithm. This study uses an experimental quantitative method with an algorithm simulation approach to apply the Fibonacci series in a product bundling discount scheme in culinary businesses. The study was conducted in several stages, as shown in Figure 1.

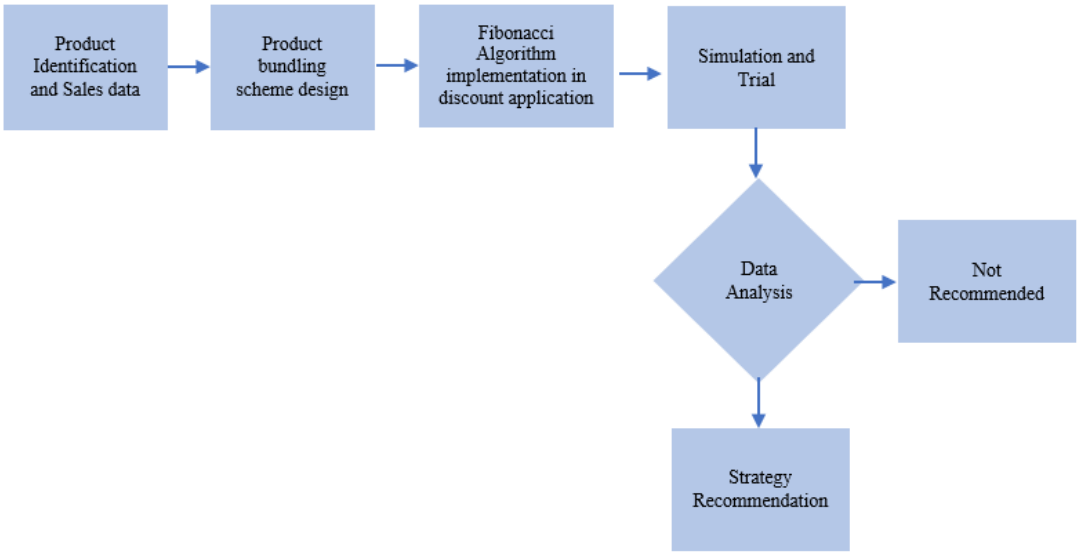

Figure 1. Research Stage Diagram

2.1 Research Strategies

This study was conducted through several systematic stages to apply the Fibonacci algorithm in culinary businesses' product bundling discount strategy. The stages are explained as follows:

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2.1.1. Product Identification and Sales Data

Historical sales data for the last six months was taken from a local culinary business. The data collected includes a list of menu prices, the most popular products, the frequency of purchases of each product, and the profit margin per product.

2.1.2. Product Bundling Scheme Design

The product bundling scheme is determined by looking at product margins, less popular products, and the most popular products. The results of the analysis create several product bundling groups so that business actors remain profitable, less popular products can be sold with products that are most in demand, and sales can be increased.

2.1.3. Application of the Fibonacci Algorithm in Determining Discounts

Discounts are given to bundling packages based on the Fibonacci number sequence, for example, 1%, 2%, 3%, 5%, 8%, and so on according to the package sequence. This discount is given in stages and adjusted to the number of products in the bundle and the minimum transaction value. This approach provides consumers more benefits as the number of products purchased increases while encouraging them to increase purchases. A progressive discount structure is expected to create attractive incentives and increase the average transaction value, which ultimately benefits both parties, both consumers and sellers.

2.1.4. Trial

The trial was conducted directly in the field for 1 month by adding bundling discounts for several products on the menu by comparing sales performance before and after implementing Fibonacci discounts. The indicators observed included sales volume, gross income, and bundling purchase conversion rates.

2.1.5. Data Analysis

The trial data were analyzed descriptively and quantitatively to see the effectiveness of using the Fibonacci algorithm in increasing the appeal of bundling and transaction value. The Fibonacci algorithm was applied by comparing data before and after bundling discounts. In addition, the study's results can be used to provide recommendations for pricing strategies that align with the characteristics of local buyers. This study also opens up opportunities to dig deeper into how other factors, such as consumer behaviour, product preferences, and purchase time, affect the effectiveness of Fibonacci-based bundling. With this approach, business actors can design more flexible and adaptive discount schemes and increase the likelihood of successful promotions by considering consumers' psychological and economic aspects.

2.2 Data Sources

This study uses primary and secondary data from the culinary business Lumpia Beef Lumer, Bekasi Regency, West Java. Lumpia Beef is engaged in a fastfood culinary business on a street-level scale. The primary data used is historical data for the last month, namely the price of each product, sales transactions, types of products sold, frequency of purchases for each product, number of daily transactions, etc. This data is taken directly from the business's daily records to analyze sales and buyer behaviour. Secondary data comes from scientific journals, textbooks, and trusted online articles relevant to discount strategies, Fibonacci algorithms, and product bundling in culinary businesses.

2.3 Application of the Fibonacci Algorithm

Discounts are calculated based on the number of products in the bundle with the Fibonacci number sequence (1%, 2%, 3%, 5%, 8%, etc.). The application of this tiered discount is in line with the principle of behavioural pricing, where customers are more responsive to discount patterns that are structured and developed logically.

Table 1. Tiered Bundling Discounts

Bundling Level	Number of Products	Discounts (%)
1	2 Products	1%
2	3 Products	2%
3	4 Products	3%
4	5 Products	5%
5	6 Products	8%

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```
INPUT: jumlah_produk_dalam_bundling (n)
OUTPUT: persentase_diskon

INISIALISASI:
  fib[0] = 0
  fib[1] = 1

UNTUK i dari 2 hingga n:
  fib[i] = fib[i-1] + fib[i-2]

diskon = fib[n]  // Misalnya: jika n=5 maka diskon = 5%
RETURN diskon
```

Figure 2. Algorithm for Determining Bundling Discounts Based on the Fibonacci Series (Pseudocode)

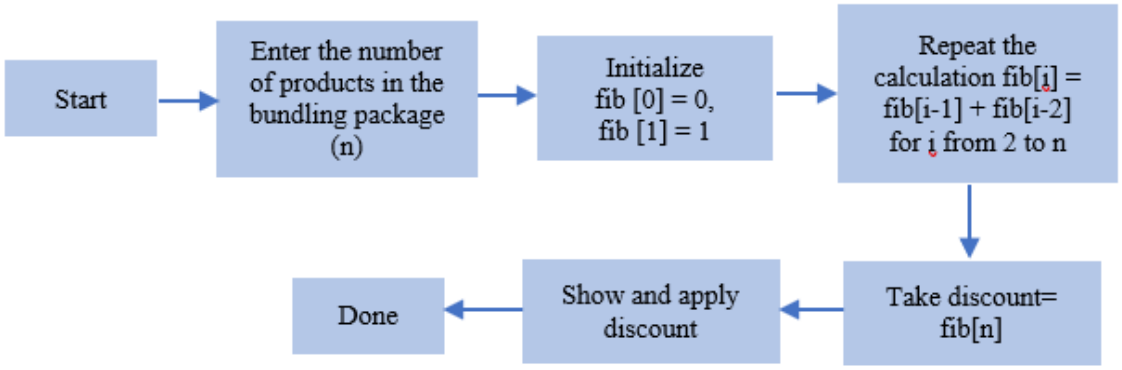

Figure 3. Flowchart of the Discount Determination Algorithm

The application of the Fibonacci algorithm in the bundling discount strategy is carried out through several systematic steps. First, the number of products in one bundling package is determined, for example, two, three, or more. Next, the Fibonacci number series is used to determine the discount percentage, with a sequence of numbers such as 0, 1, 1, 2, 3, 5, 8, 13, and so on. Each level of the number of products bundled is then adjusted to the Fibonacci sequence; for example, the purchase of two products is given a discount of 1%, three products get a discount of 2%, four products get 3%, five products 5%, six products 8%, and so on following the sequence pattern. This discount is applied in stages so that the more products purchased in one bundle, the greater the discount obtained, but within reasonable and controlled limits. After implementation, the performance of this bundling strategy is evaluated periodically by comparing sales data before and after the discount is applied to determine the effectiveness of this approach in increasing sales and maintaining business profit margins.

The Fibonacci algorithm is used in the bundling strategy by providing tiered discounts based on the number of products in one package. The more products purchased, the greater the discount given according to the Fibonacci sequence, where each value is calculated using the formula F (n) = F (n−1) + F (n−2), where F (0) = 0, F (1) = 1. For example, if the bundling consists of 5 products, then F (5) =, discount = 5%. This approach is psychologically attractive and maintains profit margins because discounts increase gradually. This strategy is flexible, easy to implement by MSMEs, and effective in driving measurable transaction increases.

2.4 Trial

After the bundling discount was implemented, the trial mechanism in this study was carried out directly on culinary businesses using a field experiment approach. The trial was implemented for one month at Lumpia Beef Lumer culinary MSME in Bekasi Regency. The Fibonacci algorithm-based bundling discount was implemented manually without an application or automated system but through conventional sales recording, which was then processed using Microsoft Excel. In its implementation, the menu and product prices remain the same. Still, customers

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are given tiered discounts according to the number of products in the bundle based on the Fibonacci sequence (for example, 2 products = 1%, 3 products = 2%, and so on). This strategy is based on behavioural pricing, which states that a progressively structured discount pattern can increase the perception of value and encourage consumer purchasing decisions [12]. Daily sales data, including the number of transactions, items sold, and gross and net income, were recorded manually and then analyzed descriptively in Excel to compare sales performance before and after the discount was implemented. As a qualitative validation, direct interviews were conducted with business owners to determine the perception and impact of the discount strategy. The entire trial process was carried out by upholding the principles of research ethics, including participant consent and data confidentiality, and aimed to assess the extent to which the Fibonacci algorithm can increase sales practically in the field.

2.5 Analysis Tools and Techniques

This study uses Python and Microsoft Excel as the primary tools for data analysis, with libraries such as Pandas, extend, and sciki for processing sales data. Bundling discounts are applied using a tiered Fibonacci number sequence, which can increase promotions' attractiveness through consumer psychology principles. Strategy evaluation is carried out quantitatively using descriptive analysis and qualitative validation through direct interviews with culinary business owners as a form of triangulation to measure the relevance and effectiveness of implementation in the field.

2.6 Research Ethics

This study was carried out by upholding the principles of research ethics, including participant consent, data confidentiality, and information disclosure. Before data collection, the researcher had asked for official permission from the culinary business owner to use sales data and conducted interviews as a form of validation. The data obtained is kept confidential and is only used for academic purposes. The entire process is carried out concerning the ethical principles of social research, namely respecting participant rights, guaranteeing anonymity, and maintaining the integrity of researchers in reporting results [13].

3 RESULTS AND DISCUSSION

3.1 Sales Data Description

This study uses historical sales data from culinary MSME Lumpia Beef Lumer in Bekasi Regency. Data is taken from the last 2 months' transaction reports, consisting of the lumpia menu, selling price, HPP per product and sales data 1 month before and 1 month after the discount is applied. The HPP per product is calculated by business actors using the COGS calculation calculator in Microsoft Excel format, which is presented in the figure with the following details:

BEEF PATTY

No	Bahan	Volume	Resep	Satuan	Harga Beli	Total Harga
1	Beef Patty	1	1	porsi	Rp 3.500	Rp 3500
2	Kulit Lumpia	1	5	lembar	Rp 234	Rp 1170
3	Delmonte Extra Hot	1000	21	gram	Rp 23.000	Rp 483
4	Delmonte Tomat	1000	21	gram	Rp 17.000	Rp 357
5	Mayones Mamayo	1000	11	gram	Rp 25.000	Rp 275
6	Makasoni Sedani	1000	15	gram	Rp 20.000	Rp 300
7	Jagung	1000	21	gram	Rp 12.000	Rp 252
8	Sayur	1000	21	gram	Rp 25.000	Rp 525
9	Margarin	1000	25	gram	Rp 23.000	Rp 575
10	Gas	3000	21	gram	Rp 22.000	Rp 154
11	Kemasan	1	1	Pcs	Rp 260	Rp 260
12					Rp	Rp
13					Rp	Rp
14					Rp	Rp
TOTAL BIAYA					Rp	7.851
PROFIT MARGIN (%)			**60**		Rp	12.562
REKOMENDASI HARGA JUAL MINIMUM					Rp	**13.000**
PAJAK (%)					Rp	
HARGA JUAL SETELAH PAJAK					Rp	13.000

Figure 4. Calculation of Lumpia Beef Patty COGS

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CHICKEN PATTY								
No	Bahan	Volume	Resep	Satuan	Harga Beli		Total Harga	
1	Chicken Patty	1	1	porsi	Rp	3.000	Rp	3000
2	Kulit Lumpia	1	5	lembar	Rp	234	Rp	1170
3	Delmonte Extra Hot	1000	21	gram	Rp	23.000	Rp	483
4	Delmonte Tomat	1000	21	gram	Rp	17.000	Rp	357
5	Mayones Mamayo	1000	11	gram	Rp	25.000	Rp	275
6	Makasoni Sedani	1000	15	gram	Rp	20.000	Rp	300
7	Jagung	1000	21	gram	Rp	12.000	Rp	252
8	Sayur	1000	21	gram	Rp	25.000	Rp	525
9	Margarin	1000	25	gram	Rp	23.000	Rp	575
10	Gas	3000	21	gram	Rp	22.000	Rp	154
11	Kemasan	1	1	Pcs	Rp	260	Rp	260
12					Rp		Rp	
13					Rp		Rp	
14					Rp		Rp	
TOTAL BIAYA					Rp			7.351
PROFIT MARGIN (%)			65		Rp			12.129
REKOMENDASI HARGA JUAL MINIMUM					Rp			**13.000**
PAJAK (%)					Rp			
HARGA JUAL SETELAH PAJAK					Rp			13.000

Figure 5. Calculation of Lumpia Chicken Patty COGS

CHICKEN KORNET								
No	Bahan	Volume	Resep	Satuan	Harga Beli		Total Harga	
1	Chicken Kornet	1	1	porsi	Rp	2.800	Rp	2800
2	Kulit Lumpia	1	5	lembar	Rp	234	Rp	1170
3	Delmonte Extra Hot	1000	21	gram	Rp	23.000	Rp	483
4	Delmonte Tomat	1000	21	gram	Rp	17.000	Rp	357
5	Mayones Mamayo	1000	11	gram	Rp	25.000	Rp	275
6	Makasoni Sedani	1000	15	gram	Rp	20.000	Rp	300
7	Jagung	1000	21	gram	Rp	12.000	Rp	252
8	Sayur	1000	21	gram	Rp	25.000	Rp	525
9	Margarin	1000	25	gram	Rp	23.000	Rp	575
10	Gas	3000	21	gram	Rp	22.000	Rp	154
11	Kemasan	1	1	Pcs	Rp	260	Rp	260
12					Rp		Rp	
13					Rp		Rp	
14					Rp		Rp	
TOTAL BIAYA					Rp			7.151
PROFIT MARGIN (%)			60		Rp			11.442
REKOMENDASI HARGA JUAL MINIMUM					Rp			**12.000**
PAJAK (%)					Rp			
HARGA JUAL SETELAH PAJAK					Rp			12.000

Figure 6. Calculation of Lumpia Chicken Corned Beef COGS

SMOKE BEEF								
No	Bahan	Volume	Resep	Satuan	Harga Beli		Total Harga	
1	Smoke Beef	1	1	porsi	Rp	900	Rp	900
2	Kulit Lumpia	1	5	lembar	Rp	234	Rp	1170
3	Delmonte Extra Hot	1000	21	gram	Rp	23.000	Rp	483
4	Delmonte Tomat	1000	21	gram	Rp	17.000	Rp	357
5	Mayones Mamayo	1000	11	gram	Rp	25.000	Rp	275
6	Makasoni Sedani	1000	15	gram	Rp	20.000	Rp	300
7	Jagung	1000	21	gram	Rp	12.000	Rp	252
8	Sayur	1000	21	gram	Rp	25.000	Rp	525
9	Margarin	1000	25	gram	Rp	23.000	Rp	575
10	Gas	3000	21	gram	Rp	22.000	Rp	154
11	Kemasan	1	1	Pcs	Rp	260	Rp	260
12					Rp		Rp	
13					Rp		Rp	
14					Rp		Rp	
TOTAL BIAYA					Rp			5.251
PROFIT MARGIN (%)			80		Rp			9.452
REKOMENDASI HARGA JUAL MINIMUM					Rp			**10.000**
PAJAK (%)					Rp			
HARGA JUAL SETELAH PAJAK					Rp			10.000

Figure 7. Calculation of Lumpia Smoke Beef COGS

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SANDWICH								
No	Bahan	Volume	Resep	Satuan	Harga Beli		Total Harga	
1	Kulit Lumpia	1	5	lembar	Rp	234	Rp	1170
2	Delmonte Extra Hot	1000	21	gram	Rp	23.000	Rp	483
3	Delmonte Tomat	1000	21	gram	Rp	17.000	Rp	357
4	Mayones Mamayo	1000	11	gram	Rp	25.000	Rp	275
5	Makasoni Sedani	1000	15	gram	Rp	20.000	Rp	300
6	Jagung	1000	21	gram	Rp	12.000	Rp	252
7	Sayur	1000	21	gram	Rp	25.000	Rp	525
8	Margarin	1000	25	gram	Rp	23.000	Rp	575
9	Gas	3000	21	gram	Rp	22.000	Rp	154
10	Kemasan	1	1	Pcs	Rp	260	Rp	260
11					Rp		Rp	
12					Rp		Rp	
13					Rp		Rp	
14					Rp		Rp	
TOTAL BIAYA					Rp			4.351
PROFIT MARGIN (%)			60		Rp			6.962
REKOMENDASI HARGA JUAL MINIMUM					Rp			**7.000**
PAJAK (%)					Rp			
HARGA JUAL SETELAH PAJAK					Rp			7.000

Figure 8. Calculation of Lumpia Sandwich COGS

Table 2. Selling Price, Product COGS, and Gross Margin

Lumpia Menu	Selling Price (Rp)	Cost of Goods Sold (COGS) (Rp)	Gross Margin (Rp)
Beef Patty	13.000	7.800	5.200
Chicken Patty	13.000	7.800	5.200
Chicken Kornet	12.000	7.200	4.800
Smoke Beef	10.000	6.000	4.000
Sandwich	7.000	4.200	2.800

3.2 Implementation of Fibonacci Algorithm in Determining Discounts

Discounts are given in stages by following the sequence of numbers in the Fibonacci series, for example, 1%, 2%, 3%, 5%, and 8%. For instance, if a customer buys two products in one package, they will get a discount of 2%, while for 3 products, the discount is 3%, and so on. This strategy not only encourages consumers to buy more products to get bigger discounts but also maintains the stability of the profit margin because the percentage of discounts given remains on a rational and controlled scale. In its implementation, each combination of products that have been previously determined is grouped into several levels of bundling packages according to the number of products. Then, the discount amount is automatically given according to the Fibonacci sequence. This strategy is designed to take advantage of the psychological effect of consumers who respond positively to gradual discounts that increase with the number of purchases [14]. In addition, this algorithm-based approach makes it easier for business owners to organise and evaluate discount promotions' effectiveness systematically and can be replicated in subsequent sales strategies [15].

Discounts are determined based on the number of products in a package and follow the Fibonacci sequence using the formula:

$$F(n)=F(n-1)+F(n-2), \text{ with } F(0)=0, F(1)=1 F(n) = F(n-1) + F(n-2)$$

Example case:

a. Customer buys 5 products with a total price:
   13,000 + 13,000 + 12,000 + 10,000 + 7,000 = Rp 55,000
b. Number of products = 5 → Fibonacci (5) = 5, then discount = 5%
c. Discount value:
   5%×Rp55,000=Rp2.7505\% \times Rp55,000 = Rp2.7505%×Rp55,000=Rp2.750
d. Price after discount:
   Rp55,000−Rp2,750=Rp52,250Rp55,000 - Rp2,750 = Rp52,250Rp55,000−Rp2,750=Rp52,250

With this approach, discounts can be given proportionally according to the purchase level, and the profit margin can still be maintained because the discount value increases gradually. The results show that this strategy can increase the number of transactions and attract buyers' interest in bundling products.

3.3 Sales Results

The sales results data used in this study were obtained from the culinary MSME Lumpia Beef Lumer located in Bekasi Regency, West Java. This data comes directly from the daily transaction records of the business for two months, namely one month before and one month after the implementation of the Fibonacci algorithm-based bundling discount strategy.

3.3.1. Types of Data Collected

a. Number of product portions sold during 1 month before the discount and 1 month after the discount
b. Total gross income
c. Net income (taking into account Cost of Goods Sold)

This data is recorded by the business owner using a diary and then integrated with Microsoft Excel to facilitate data collection and analysis digitally. Recording is done consistently and validated directly through communication with the business owner.

3.3.2. Source and Process of Graphic Visualization

The sales and revenue increase graph shown in Figure 2 in the journal is obtained from the results of quantitative analysis using Microsoft Excel software. The visualization is created based on raw transaction data processed in Python using libraries such as pandas and matplotlib before being finalized in Power BI. The graph shows a comparison of:

a. Number of servings sold before and after the discount
b. Gross and net revenue before and after discount

Table 3. Comparison of Sales and Revenue

Description	Before Discount	After Discount
Portion Sold	1.680	2.490
Gross Revenue (Rp)	19. 860.000	32.600.000
Net Revenue (Rp)	8.329.320	12.960.000

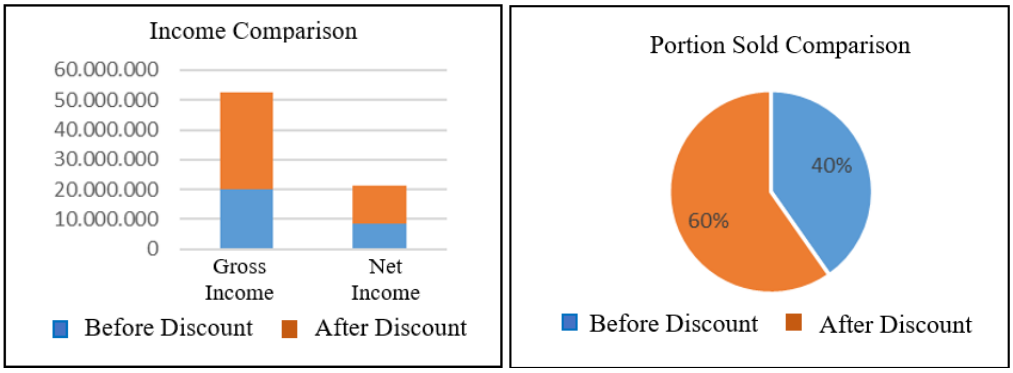

Figure 2. Increase in Revenue and Portion Sold

The increase in transaction volume after a 60% discount and revenue after a 60% discount indicate that the Fibonacci bundling discount strategy succeeded in increasing purchase quantity and maintaining profitability. This shows a balance between sales volume and profit margin. This strategy is relevant because bundling can increase sales efficiency [16].

3.4 Validation of Results to Business Owners

The validation of the results was carried out through direct interviews with the owner of Lumpia Beef Lumer. The owner was interviewed with several questions about the sale of Lumpia Beef Lumer. Here are some questions and answers from the business owner.

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Table 4. Results of Interviews with Business Owners

Num.	Question	Answer
1	What do you think about implementing discounts with the Fibonacci pattern in a product bundling strategy?	*"This kind of discount pattern is unique and engaging for customers. They feel like they are getting more benefits as the number of purchases increases. This discount pattern indirectly encourages them to buy more than one product".*
2	Does this bundling strategy impact increasing sales, especially products that were previously less in demand?	*"Yes, quite significantly. Products that were previously rarely glanced at by buyers are now starting to be purchased because they are included in the bundling package. This helps reduce stock and increase product turnover".*
3	Does this Fibonacci discount strategy affect business profits?	*"Not negatively. It is still profitable because we choose products with a certain margin to be included in the bundling. So, even though there is a discount, the total transaction value increases, and the profit margin can still be maintained".*
4	Do customers feel confused by the Fibonacci discount system?	*"There were some questions at first, but after explaining that the discounts follow a tiered numerical sequence (1%, 2%, 3%, etc.), they quickly understood and were curious to try buying more to determine the next discount".*
5	Will you continue to use this strategy in the future?	*"Yes, this strategy increases sales and makes our promotions look more creative and unusual. This could be a new characteristic in the way we offer savings packages".*

Based on the interview results, the owner stated that the bundling strategy with Fibonacci discounts was considered attractive by customers and remained profitable because the discounted products did not ignore the profits obtained; many products that were less in demand by buyers were sold more than before. The business owner likely continue to use this strategy in the future. The Fibonacci discount strategy in bundling culinary products is similar to previous research, which stated that the bundling strategy could significantly increase sales of food MSMEs [17]. The difference in this study lies in the algorithmic approach based on Fibonacci numbers, which provides a more systematic and easily controlled discount structure.

4. CONCLUSION

Applying the Fibonacci algorithm to determine bundling discounts in the Lumpia Beef Lumer culinary business in Bekasi Regency has proven effective in increasing sales performance. The study results showed an increase in sales volume and gross income of 60% after the Fibonacci discount strategy was implemented. Customers tend to be more interested in bundling packages that offer tiered discounts, motivating them to buy more items in one transaction and increasing the total transaction value.

The advantages of this method include a measurable and straightforward discount structure, making it easy for micro-entrepreneurs to understand and implement. In addition, the risk of over-discounting can be minimized because discounts follow the proportional pattern of the Fibonacci series. This allows entrepreneurs to increase transaction value without sacrificing profit margins significantly. However, several shortcomings need to be considered. This study was only conducted on one business unit on a local scale, so the results obtained cannot be generalized to other culinary businesses. In addition, the research model did not include external factors such as seasons, promotions from competitors, and market trends that can affect the effectiveness of discounts. Finally, the long-term efficacy of the Fibonacci discount strategy has not been tested over a long and sustainable period, so further research is needed to determine its long-term impact on the business.

REFERENCES

[1] A. M. Dewi, "Kondisi Industri Pengolahan Makanan dan Minuman di Indonesia," www.djkn.kemenkeu.go.id/.
[2] https://doyanayam.com/blog/bisnis/strategi-product-bundling/, "Strategi Product Bundling: Definisi, Jenis, dan Manfaatnya untuk Bisnis Kuliner," www.doyanayam.com.

[3] W. Firmansyah, T. Sutabri, D. D. Yanti, and N. A. Pratiwi, "Analisis peluang dan tantangan pemanfaatan metaverse sebagai pemasaran digital," *J. Ilm. Wahana Pendidik.*, vol. 10, no. 18, pp. 1009–1016, 2024.
[4] www.digima.co.id, "Pemasaran Berbasis Data untuk UMKM," www.digima.co.id. [Online]. Available: https://digima.co.id/pemasaran-berbasis-data-untuk-umkm/?utm_source=chatgpt.com
[5] R. Wiliyanto, A. Mahirah, and F. Firmansyah, "Penentuan Strategi Promosi UMKM Fashion dan Souvenir dengan Metode Market Basket Analysis," *J. Informatics, Inf. Syst. Softw. Eng. Appl.*, vol. 4, pp. 46–54, May 2022, doi: 10.20895/inista.v4i2.559.
[6] www.readers.id, "Pelaku Usaha Perlu Memahami Algoritma Digital," *https://www.readers.id/read/pelaku-usaha-perlu-memahami-algoritma-pemasaran-digital*, Nov. 15, 2022.
[7] A. Anggi Mardiana, "Memahami Pola Bilangan Fibonacci, Rumus, dan Contoh Soalnya Artikel ini telah tayang di Katadata.co.id dengan judul 'Memahami Pola Bilangan Fibonacci, Rumus, dan Contoh Soalnya' , https://katadata.co.id/lifestyle/edukasi/63e2032ea5d4d/memahami-pola-bilangan-fibonacci-rumus-dan-contoh-soalnya Penulis: Anggi Mardiana Editor: Agung," www.katadata.co.id.
[8] N. Rahmi *et al.*, *Eksplorasi Penerapan Matematika & Statistika*. Indonesia Emas Group, 2025.
[9] T. Sutabri and D. Napitupulu, "SISTEM INFORMASI BISNIS," 2019.
[10] K. Wijaya, "Penerapan Algoritma Apriori Sebagai Penentu Diskon Paket Barang Berdasarkan Pola Pembelian Konsumen," 2021, [Online]. Available: https://repository.pnj.ac.id/id/eprint/4236/%0Ahttps://repository.pnj.ac.id/id/eprint/4236/3/Jurnal_4817040195_Kiki Wijaya.pdf
[11] F. Achmad, O. Nurdiawan, and Y. A. Wijaya, "Analisa Pola Transaksi Pembelian Konsumen Pada Toko Ritel Kesehatan Menggunakan Algoritma Fp-Growth," *JATI (Jurnal Mhs. Tek. Inform.*, vol. 7, no. 1, pp. 168–175, 2023.
[12] S. Baier, "How to Win Customers with Behavioral Pricing," www.buynomics.com. Accessed: Apr. 15, 2025. [Online]. Available: https://www-buynomics-com.translate.goog/articles/behavioral-pricing?_x_tr_sl=en&_x_tr_tl=id&_x_tr_hl=id&_x_tr_pto=sge#:~:text=Supermarket,dalam pasar yang sangat fluktuatif.
[13] J. W. Creswell and J. D. Creswell, *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage publications, 2017.
[14] B. Kustiawan, A. Apriyanto, T. Haryanti, and A. Rustam, *Perilaku Konsumen: Pendekatan Strategis*. PT. Sonpedia Publishing Indonesia, 2025.
[15] H. Wijoyo, Y. Cahyono, A. Ariyanto, and F. Wongso, "Digital economy dan pemasaran era new normal," *Insa. Cendekia Mandiri*, 2020.
[16] M. Z. Rabbil, R. Permana, and F. A. Zahra, "Strategi Pemasaran Product Bundling Dalam Meningkatkan Penjualan Produk Hijab Sattka," vol. 2, no. 3, pp. 315–325, 2025.
[17] E. Komara, S. Rimadias, S. Kolila, and N. Luthfia, "Penguatan Brand Awareness Pada UMKM Bakso Raja Sapi," *Sejah. J. Inspirasi Mengabdi Untuk Negeri*, vol. 3, no. 3, pp. 97–106, 2024.