

Food Sellers Strategy Based on Customer Reviews Before and During Covid-19 Pandemic in Indonesia

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Abstract

The survival and resilience of food sellers in Indonesia during Covid-19 pandemic is important to be discussed. This study proposes new strategies for food sellers in Indonesia based on customer reviews before and during the pandemic, and food sellers' competition profile. Customer reviews are scraped from 20 food sellers in Java, Indonesia. A method of text mining is then applied, and the texts collected are classified into 11 attributes. The next process is sentiment analysis to separate the positive and the negative reviews, to be analyzed further in two types of gap analyses. The first is gap analysis between positive and negative reviews to portray the food sellers' strengths and weaknesses. The second gap analysis identifies the gap of customer reviews before and during the pandemic to predict the change of customers' needs. The results show that product, place, and services are always the customer's top-of-mind attributes, no matter in normal or pandemic situations, so that food seller should always maintain those aspects. This study also identifies several new strategies related to health protocol. Furthermore, related to online business competition, this study observes the food sellers' growth in online marketplace. The result shows that the monthly growth score of food sellers increases significantly from 2 to 9 because of the pandemic. Thus, food sellers need to consider the opportunity for online business, while maintaining their strengths. Compared to similar studies in other countries, the findings of this study differ in terms of the dominant attributes, related to different cultures.

Keywords: Covid-19, food sellers, customers review, text mining, gap analysis, strategy

Abstrak

Kemampuan bertahan gerai makanan di Indonesia, terutama dalam situasi pandemi Covid-19, penting untuk dibahas. Studi ini dilakukan untuk mengusulkan strategi baru bagi gerai makanan di Indonesia berdasarkan ulasan pelanggan sebelum dan selama pandemi, serta profil kompetisi gerai makanan. Ulasan pelanggan di-scrap dari 20 gerai makanan di Jawa, Indonesia. Langkah selanjutnya adalah text mining, dan teks yang terkumpul diklasifikasikan dalam 11 atribut. Proses berikutnya adalah sentiment analysis, untuk memisahkan ulasan positif dan negatif, untuk dianalisis lanjut dalam dua jenis analisis gap. Pertama adalah analisis gap antara ulasan positif dan negatif, untuk memotret kekuatan dan kelemahan gerai makanan. Analisis gap yang kedua dilakukan untuk mengidentifikasi gap antara ulasan pelanggan sebelum dan selama pandemi, untuk memprediksi perubahan kebutuhan pelanggan. Hasil analisis menunjukkan bahwa produk, tempat, dan layanan selalu menjadi atribut top-of-mind dari pelanggan, baik dalam kondisi normal maupun pandemi, sehingga gerai makanan harus selalu mengelola aspek-aspek tersebut. Studi ini juga mengidentifikasi beberapa strategi baru terkait protokol kesehatan. Terkait dengan kompetisi dalam bisnis online, studi ini mengobservasi pertumbuhan jumlah gerai makanan dalam sebuah marketplace. Proses scraping sampel data dalam marketplace tersebut menunjukkan bahwa skor pertumbuhan bulanan dari gerai makanan meningkat signifikan dari 2 sebelum pandemi menjadi 9 selama pandemi. Dengan demikian, gerai makanan perlu mempertimbangkan peluang untuk berbisnis secara online, sambil mengelola kekuatannya untuk memenangkan pasar. Dibandingkan dengan studi serupa di negara-negara lain, temuan dari studi ini berbeda dalam hal atribut yang dominan dan kebutuhan baru yang diusulkan pelanggan selama pandemi, terkait dengan perbedaan budaya.

Kata kunci: Covid-19, gerai makanan, ulasan pelanggan, text mining, analisis gap, strategi

1. Introduction

1.1. Background

The covid-19 outbreak has shown that in an extraordinary event, the supply chain resilience to disruption needs to be built for its survival. Covid-19 pandemic raises the problem of goods supply, including food, especially in its early months (Benton, 2020;

Dewantoro & Saogo, 2021). Supply chains and markets were collapsed so it is important to secure the supply of the foodservice industry (Ivanov & Dolgui, 2020). During the Covid-19 pandemic, people are subject to physical distancing in almost all regions. This situation has created serious problems for the foodservice industry around the world.

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Indonesia as the 4th largest population in the world and consisting of many islands with mountainous profiles also faces many problems in the food supply chain during the Covid-19 pandemic. Java, an island with the highest population density in Indonesia, takes the worst impact of the pandemic, especially as a result of the restriction of community activities by the government (CNN Indonesia, 2020). There are many examples of policies applied in many countries to manage the food supply chain. However, the specific characteristic of Indonesia needs a particular study.

According to Statistics Indonesia (Statistics Indonesia, 2020), the food and beverage sector contributes 7.3% of GDP in the first three quarters of 2020. There is also a potential contribution of 6.6% of GDP through food-related sectors like the transportation and storage sector, and the accommodation and foodservice sector. As part of the food supply chain connecting food manufacturers to its customer, the survival and resilience of food sellers in Indonesia, especially during the Covid-19 pandemic situation is important to be discussed.

This study aims to propose new strategies for food sellers in Indonesia to be survived in Covid-19 pandemic situation, by analyzing the change of their strengths and weaknesses, the customers preferences, and the competition, before and during the pandemic.

1.2. Literature Review

Research articles about food have been published since 1831, increased around 1975, and then increased significantly around 2010 (Elsevier, 2020). Accordingly, research articles about restaurants or food sellers were first published in 1936, increased significantly around 2010, and increased in 2020 by more than 23%. Some research and review articles about restaurant published during 2019 to 2021 discussed customer focus attributes, i.e. brand (Rodríguez-López et al., 2020; Kim et al., 2021; Peng & Chen, 2021), price (Kim et al., 2021; Cantele & Cassia, 2020; Huifeng et al., 2020), ingredients (Rodríguez-López et al., 2020; Bertan, 2020), experience (Rodríguez-López et al., 2020; Peng & Chen, 2021; Chen, Huang, Zhang, 2020; Dedeoglu & Bogan, 2021; Luo & Xu, 2021; Chang et al., 2021), environment or atmosphere (Bertan, 2020; Chen, Huang, Zhang, 2020; Dedeoglu & Bogan, 2021; DiPietro et al., 2019; Chang et al., 2021), product (Bertan, 2020; Chen, Huang, Zhang, 2020; Luo & Xu, 2021; DiPietro et al., 2019; Kwon et al., 2020), service (Kim et al., 2021; Bertan, 2020; Luo & Xu, 2021; DiPietro et al., 2019; Kwon et al., 2020; Taha, Osaili, Albloush, & Nassoura, 2020), and facilities (Luo & Xu, 2021; Chang et al., 2021; Kwon et al., 2020; Wang et al., 2021; Yu et al., 2021). Some of the articles describe the change of attributes by time and the influence of region (Rodríguez-López et al., 2020). Additionally, most research articles about restaurants published in 2021 talk about treatments related to the Covid-19

pandemic like customer trust (Dedeoglu & Bogan, 2021; Yosh & Cheng, 2021), sanitation and disinfection (Chang et al., 2021), and safety (Wang et al., 2021; Yu et al., 2021).

Restaurant brands became attractive for customers before the year 2000, even though it still less considered than price. Later, after 2010, the brand became customer focus, more than the price (Rodríguez-López et al., 2020). People who have no problem with money choose branded or luxury restaurants because of their trust and standard for food and services. Brands have a strong relationship with sales in a pandemic situation (Kim et al., 2021). However, during a pandemic, research shows that luxury restaurants experiencing more incomplete reservations (Peng & Chen, 2021).

Until now, price has always been a consideration for consumers in buying goods and services. The intention of customers to visit a restaurant is strongly correlated with price and other financial risks. The lower the price and other financial risks in a restaurant, the higher the customer visit intention to the restaurant (Huifeng et al., 2020). In the context of delivery services like the common situation during the Covid-19 pandemic, the price perceived by customers includes delivery or transportation fee (Kim et al., 2021). Price is actually a restaurant's problem more than customers' problem, i.e., how a restaurant can serve marketable price by cost efficiency while striving restaurant image (Cantele & Cassia, 2020).

Ingredients in food are sensitive for human health, and specifically for the human brain (Rodríguez-López et al., 2020). Thus, food ingredients have become a research interest, as well as people's interest, in recent years. One example is a gastronomic restaurant (Bertan, 2020). The recent growth of gastronomic restaurants and healthy concept restaurants are proven to be significantly correlated with the increase of people's awareness of food ingredients.

Experience is one of the factors influencing a customer to repeat the visit or the order to a restaurant. Experience can be personal or communal. Personal experience is related to emotion and satisfaction (Rodríguez-López et al., 2020) from the previous visit or order. A text mining on online restaurant reviews shows that customers' experience on the expected value of the food ordered is the most factor affecting their satisfaction (Luo & Xu, 2021). Communal experience is related to culture (Rodríguez-López et al., 2020; Chen et al., 2020), social status, and financial background (Peng & Chen, 2021; Dedeoglu & Bogan, 2021). In terms of tourism, traditional restaurants with local cuisines are mostly more attractive than common restaurants (Chen et al., 2020). The need for sociability with no budget constraint makes customers repeating the visit or order to upscale restaurants (Dedeoglu & Bogan, 2021). In the Covid-19 pandemic situation, experiencing a clean environment

and atmosphere become the most important aspect for dine-in customers (Chang et al., 2021).

Related to experience, restaurant atmosphere or environment becomes an important factor for dining in. Lifestyle served by, for example, a traditional architecture restaurant or a sophisticated gastronomic restaurant, is interesting for many people and giving a strong effect on customer loyalty (Bertan, 2020; Chen et al., 2020). A comfortable situation facilitating social interaction in a restaurant is highly expected by a dine-in customer and giving significant effect to customer visits (Dedeoglu & Bogan., 2021; DiPietro et al., 2019). Now, in the Covid-19 pandemic situation, clean and safe restaurants related to air quality and circulation become the most customer consideration (Chang et al., 2021).

The food product, certainly, is the main factor in a restaurant business. Taste, flavor, menu variation, drink, and presentation are the most appeared factors in research (Bertan, 2020; Luo & Xu, 2021; DiPietro et al., 2019; Kwon et al., 2020). Regarding the variation of customer needs in food, a restaurant may decide its advantage to be qualified in or winning the market. A specific product like gastronomic food (Bertan, 2020), traditional cuisines (Chen et al., 2020) are examples to win the market. Food condition (fusion, temperature, health) becomes one of the important attributes in the Covid-19 pandemic situation (Luo & Xu, 2021).

Because a restaurant is a combination of goods and services business, the services aspect takes an important role in restaurant success. Services aspect in a restaurant business cover staff performance, waiting time, reservation, ordering process, delivery, help, and hospitality (Kim et al., 2021; Bertan, 2020; Luo & Xu, 2021; DiPietro et al., 2019; Kwon et al., 2020; Taha et al., 2020). The most important service in an online restaurant due to the Covid-19 pandemic is delivery, that is including delivery time, delivery fee, delivery partner, and food condition after delivery (Kim et al., 2021; Luo & Xu, 2021; Taha et al., 2020).

Restaurant facilities consist of physical and non-physical facilities. Physical facilities considered by customers are, for instance, location, street, parking, building, space, outside seating, park, walk, and restroom (Luo & Xu, 2021; Kwon et al., 2020). The Covid-19 pandemic situation makes cleanness of the physical facilities (Chang et al., 2021), the level of crowdedness (Wang et al., 2021), and the condition of indoor and outdoor facilities (Yu et al., 2021), become the most important factors. Non-physical facilities cover WiFi access and the online ordering system (Luo & Xu, 2021; Kwon et al., 2020).

As aforementioned, culture is one of the dimensions affecting the perceived experience of customers. Culture is related to a geographical area. Before the Covid-19 pandemic, the services aspect (staff, environment, culture, cleanness) is needed more than the food itself in Asia and Europe (Cantele & Cassia, 2020; Bertan, 2020;

Chen et al., 2020; DiPietro et al., 2019). In America, food is more important in a restaurant than services aspects (Kwon et al., 2020). Table 1 presents the supporting data. During the Covid-19 pandemic situation, the most important factors of a restaurant for the people in Asia and Europe are safety and services (Kim et al., 2021; Peng & Chen, 2021; Dedeoglu & Bogan., 2021). For Americans and Australians, the most considered factors of a restaurant are food, safety, and services aspects (Luo & Xu, 2021; Wang et al., 2021). The data is presented in Table 2.

Table 1. Review on Most Influencing Factors of Restaurant Performance Before Pandemic

Ref.	Country	Area	Most Influencing Factor		
			1 st	2 nd	3 rd
[12]	China	Asia	Staff	Envirt.*	Food
[9]	Italy	Europe	Staff	Culture	Envirt.*
[11]	Turkey	Europe	Staff	Envirt.*	Food
[15]	Netherland	Europe	Food	Cleanness	Staff
[17]	USA	America	Food	Excell.**	Service

*Environment

**Excellency

Table 2. Review on Most Influencing Factors of Restaurant Performance During Pandemic

Ref.	Country	Area	Most Influencing Factor		
			1 st	2 nd	3 rd
[7]	China	Asia	Brand	Location	Safety
[8]	Taiwan	Asia	Culture	Exp.*	Excell.**
[13]	Turkey	Europe	Safety	Exp.*	Culture
[14]	USA	America	Exp.*	Service	Food
[19]	USA	America	Safety	Food	Envirt.***
[19]	Australia	Australia	Food	Safety	Envirt.***

*Experience

**Excellency

***Environment

Besides culture, time frames also change customer perceptions on the important factors of a good restaurant. From the year 2000 to 2009, service quality, customer behavior, business management, marketing, ethnicity, brand, and image are the most topics discussed (Rodríguez-López et al., 2020). From 2010 to early 2020, the most studied topics about restaurants are customer satisfaction, profitability, food attributes, brand, social aspects, business scale, customer emotions, management systems, health and hygiene, atmosphere and environment, and hospitality (ScienceDirect Advanced Search, 2021; DiPietro et al., 2019). Stimulated by the Covid-19 pandemic, the topics studied since late 2020 are shifted to safety-based aspects (Chang et al., 2021; Wang et al., 2021; Yu et al., 2021).

A study during late 2020 on hundreds of restaurants in the USA and Australia (Wang et al., 2021) classify the restaurants into three levels of crowdedness (high, low, medium) and four types of safety treatment (using safety measures, using a partition, widen distances between tables, not using in-between tables). The study portrays buying behavior of the restaurants' customers (eat-in, takeaway, leave). The result shows that the level of crowdedness is negatively correlated to the willingness of a customer to buy, especially to eat in. In terms of

safety treatment applied in restaurants, the most acceptable treatment for a customer is not using in-between tables. The second most acceptable, the third most acceptable, and the most unacceptable treatment are: widen distances between tables, using a partition, and using safety measures, respectively.

Besides the crowdedness, air condition inside the restaurant also influences the possibility of virus spread. Outdoor dining is more recommended than indoor dining, particularly indoor restaurants with cooking or grilling in the dining room (Chang et al., 2021). An experiment of indoor viruses-contained airflow in a restaurant in Korea is conducted using an electronic heater pump and virus-similar particles (Yu et al., 2021). The result shows that the pump successfully spreads the particles throughout the room. A particles detector placed farthest from the pump, even, counts the highest particles density.

The past researchers mostly use customer survey to explore the customer behavior and preferences. The novelty of this study is the use of sentiment analyses, followed by gap analyses, to evaluate further the results of sentiment analyses. Furthermore, the unique cases related to Covid-19 pandemic in Indonesia will contribute to enrich the Covid-19 pandemic related data.

1.3. Conceptual Framework

During this pandemic, for sure there are changes that food sellers must do. With the help of digital technology, many activities have become online (Saeed et al., 2020), including in the foodservice industry. This system became a new strategy for food sellers; therefore, it is important to learn about and take advantage of these online sales trends and develop appropriate strategies.

A new marketing strategy can be determined by considering several aspects, including new behavior and preferences from both customers and competitors. Customer opinion is a source of understanding customers' needs and behavior. In today's digital era, one alternative to acquire consumer insight is through customer reviews on social media (He et al., 2017). Text mining techniques can be used to transform raw data of customer reviews into interesting data patterns by which the information needed as knowledge can be captured (Turban et al., 2005; Han & Kamber, 2006). The customers' top-of-mind, i.e., the most keyword mentioned by customers in their reviews, can be seen as the strongest performance attribute noticed by the customer of food sellers.

Another important aspect is the competitors. A crisis can cause a market decline, so that competition increases and may change competitors' behavior (Kotler & Armstrong, 2018). Hence, the new competition structure must be considered. Identification of competitor growth in the digital era can be portrayed by observing the growth of similar shops in a marketplace. The highest the growth, the tighter the competition, yet at the same

time, can be seen as an indication of customer interest or market opportunity.

Figure 1 illustrates a framework of how a new marketing strategy can be developed based on customer reviews and competitor growth data. The strategy proposed in this study is dedicated to an infectious-contagious-diseases pandemic situation like the Covid-19 pandemic. Regarding that the end of the Covid-19 pandemic still cannot be predicted, the result of this study is expected to help food sellers in Indonesia a few years later. In addition, the simple method proposed in this study can be utilized by food sellers to analyze their business.

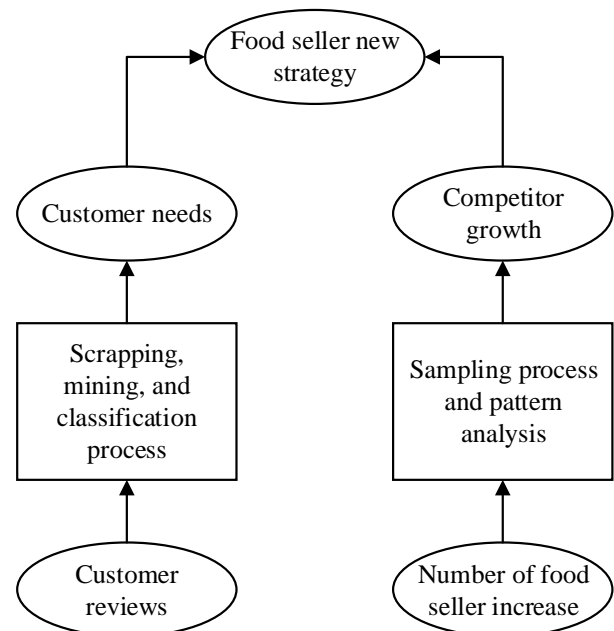


Figure 1. The Theoretical Framework of Food Seller Development Strategy Based on Customer Reviews and Competitor Growth Data

1.4. Research Question

As discussed in other studies, different geographical area exhibits different customer needs because of different culture and expectations of restaurant attributes (Kim et al., 2021; Peng & Chen, 2021; Cantele & Cassia, 2020; Bertan, 2020; Chen et al., 2020; Dedeoglu & Bogan, 2021; Luo & Xu, 2021; DiPietro et al., 2019; Kwon et al., 2020; Wang et al., 2021; Yu et al., 2021). Covid-19 pandemic creates a different situation in every country, regarding the level of development of the country, the government system, the population density, and the citizen behavior. Indonesia as a developing country with more than 270 million population with a specific characteristic, is the object of this study.

This study focuses on studying new strategies for Indonesian food sellers, by assessing the gap in customer values and competition, before and during the Covid-19 pandemic. The highest the gap of a value attribute, the most important the related aspects to be changed. Thus, the research questions that will be answered are:

Q1. How did customer reviews for food sellers change before and during the Covid-19 pandemic?

Q2. How did the food seller competition grow before and during the Covid-19 pandemic?

Q3. What values do food sellers need to pay attention to, to survive during the Covid-19 pandemic?

2. Research Method

The steps performed in this study are presented in Figure 2. The following paragraphs will explain every step, in detail.

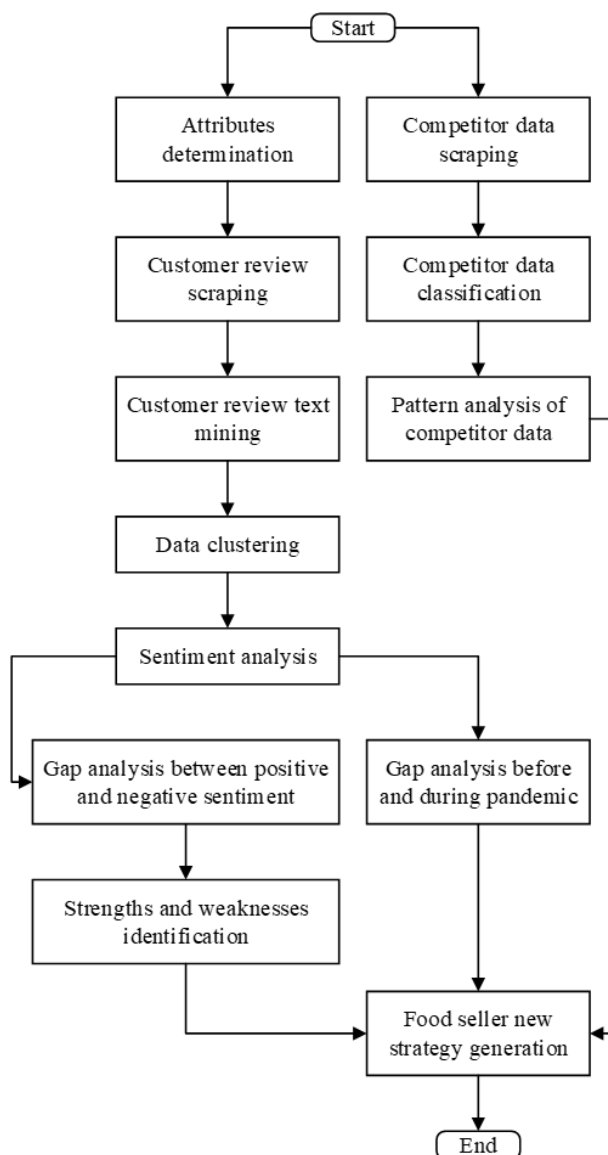


Figure 2. The Flow of Research Method

2.1 Attributes Determination

This study begins with a literature review, to obtain a basis for the attributes. The classical concept of the marketing mix, i.e.: product (including services), price, place, and promotion (Kotler & Armstrong, 2018), and the pandemic related aspects (Benton, 2020; Kim et al., 2021; Peng & Chen, 2021; Dedeoglu & Bogan, 2021; Luo & Xu, 2021; Chang et al., 2021; Taha et al., 2020; Wang et al., 2021; Yu et al., 2021; Yost & Cheng, 2021;

Saeed et al., 2020) are the basis of the attributes defined in this study. The attributes are used to categorize data resulted from text mining.

2.2 Data Scraping

The second step of the study is data scraping. There are two types of data taken from the scraping process, i.e., customer reviews and competitor growth. Customer reviews data are texts taken from Google Review, using a web scraper from Google Extension. These reviews are classified into two groups, reviews before the Covid-19 pandemic and reviews during the Covid-19 pandemic. The samples are 309 reviews taken from 20 food sellers in 7 cities on Java Island. The food sellers chosen are those that can be identified in Google, established for more than one year, and get more than 20 customer reviews. Besides, the 20 objects consist of various types of food sellers like those offering meals, fast food, bites, snacks, and beverages. The reviews scraped are the ones recorded from 2019 until September 2020. The Java Island is chosen because it is the largest of all major islands in Indonesia with a population density of more than 1,000 persons per square kilometer. With a land area of less than 7% of the total land area in Indonesia, Java Island is habited by more than 50% of Indonesia's population. With this demography, Java Island becomes the most impacted island by the Covid-19 pandemic in Indonesia. The 20 food sellers are in Bogor, Jakarta, Surabaya, Salatiga, Semarang, Yogyakarta, and Pekalongan, some of the cities in Java Island with the most population density. The 20 food sellers sell meals, snacks, and beverages.

Competitor growth data shows the increased rate of the number of food sellers and non-food sellers in the marketplace. The data is taken by sampling in Tokopedia, one of the top listed marketplaces in Indonesia. These competitor growth data are also classified into before-pandemic data and during-pandemic data. To validate the competitor data pattern analysis, the seller data scraped is also including the non-food sellers. The total number of food sellers scraped is 113, while the non-food sellers are 110.

2.3 Text Mining

Text mining is a knowledge-intensive process in which users interact and work with a set of unstructured texts using several analytical tools (Feldman & Sanger, 2007; Pratiwi, 2018; He et al., 2013). Text mining extracts the patterns from unstructured textual data, not from a database. People use Natural Language Processing for the analysis of such unstructured texts (Pratiwi, 2018). In general, text mining consists of text pre-processing and selection features (Feldman & Sanger, 2007). Text mining has been used for many applications. For example, to assess the competition in the pizza industry (He et al., 2013). They did a content analysis based on customer-generated content. In this

research, text mining is used to get customer insight, especially from customer reviews.

In this study, the texts from the scraping process were then mined using Microsoft Excel. Figure 3 shows the steps of the text mining process.

The followings are the steps of the text mining process conducted in this study:

- performing data cleaning by deletion of meaningless or ambiguous comments like “oke” (okay) or “mantap” (great);
- collecting only the feasible comments, i.e.: the ones containing a meaningful opinion like ‘enak’ (delicious), that can be meant as an expression of taste of the food or beverage, while simultaneously improving the library in (a)
- identifying the positive and negative comments;
- mining of meaningful keywords; and
- recapitulation of the keywords collected.

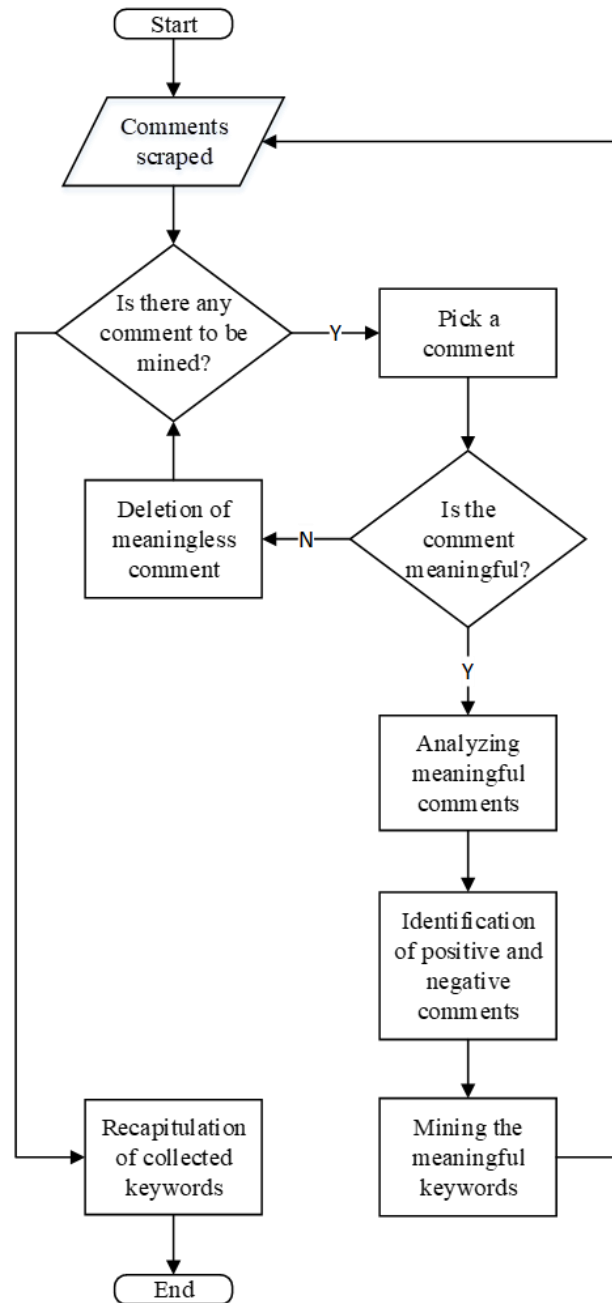


Figure 3. Text Mining Mechanism

2.4 Data Clustering

The highlighted texts generated from the text mining are then clustered into a number of attributes defined based on the literature review and theory. Text mining and clustering are performed to portray customer needs and expectations. The clusters are defined based on the classical concept of the marketing mix, i.e., product (including services), price, place, and promotion (Kotler & Armstrong, 2018), and the pandemic-related aspects. The pandemic-related aspects are empirically defined from the finding in the text mining process.

2.5 Sentiment Analysis

Sentiment analysis is performed to separate positive and negative reviews. Currently, textual unstructured

information is widely available on the internet in the format of forums, blogs, social media, and websites with reviews such as Google Reviews. With the help of sentiment analysis, the unstructured data can be converted into more structured data. Such data can explain public opinion about products, brands, services, politics, or other topics. Sentiment analysis is a tool used by companies, governments, and other fields for a variety of purposes such as marketing analysis, product reviews, product feedback, and community service (Annisa, 2020; Gan et al., 2017). The results of sentiment analysis will be the input for the next step, i.e. gap analysis.

2.6 Gap Analysis

The gap analysis in this study is performed to find: (1) the gap between positive and negative reviews, and (2) the gap between customer needs before and during the Covid-19 pandemic. Some researchers use the SERVQUAL model to do a gap analysis between customer expectation and customer perception of services (Parasuraman et al., 1985; Zheithaml et al., 2000; Rodríguez-Díaz et al., 2018), while this study applies the gap analysis in different viewpoints, i.e., the gap of customer expectations in two different aspects.

The first gap analysis is dedicated to portraying the gap between positive and negative customer reviews. The small gap between positive and negative customer reviews on an attribute can be interpreted as the balance of variation of the performance of the attribute. The wide gap between positive and negative customer reviews on an attribute will give insights into the strengths (if the positive review is the largest one) and weaknesses (if the negative review is the largest one) of the food sellers. Analysis of strengths and weaknesses is one of the basics to develop business strategies (Wahyuni *et al.*, 2020).

The second gap analysis is utilized to portray the gap of customer expectation in two different conditions, before and during the Covid-19 pandemic. The gap of the customer reviews before and during the pandemic will give insights for the food seller to change the selling and marketing strategies during the pandemic, which its end is still unpredictable. A large gap of an attribute before and during the pandemic means that a new strategy for the pandemic situation is absolutely required. Otherwise, a small gap of an attribute before and during the pandemic indicates that a new strategy is not really necessary.

2.7 Generating the Strategy

The results of gap analysis altogether with the pattern analysis of the competitor growth will lead to the generation of marketing strategy for food sellers. The pattern analysis of competitor growth will illustrate both the level of tightness of competition and the opportunity to get a new market.

3. Result and Discussion

3.1 Customer Reviews Keywords Before and During Covid-19 Pandemic

From the text mining process, there are 44 highlighted terms of customer reviews before and during the Covid-19 pandemic, that can be grouped into 11 attributes. The attributes – defined based on the product (including services), price, place, promotion, and pandemic related aspects – are as follows:

- payment method, experienced and proposed by the customer;
- order method, experienced and proposed by the customer;
- reservation method, experienced and proposed by the customer;
- duration, i.e.: duration of service experienced by the customer;
- facilities, experienced and proposed by the customer;
- number of visitors, related to crowdedness experienced by the customer;
- pandemic prevention, experienced and proposed by the customer;
- product, experienced and proposed by the customer;
- service, experienced and proposed by the customer;
- place, experienced and proposed by the customer; and
- other, i.e.: unique meaningful keywords cannot be categorized into the other 10 categories.

Figure 4 and Figure 5 show the results of text mining before and during the pandemic, respectively, based on the 11 attributes. Figures 4 and 5 show that product, place, and service are always in customers' top-of-mind about food sellers in Indonesia. These phenomena are different from the finding in other countries as shown in Table II and Table III. In other countries, safety factors are the customers' top-of-mind during a pandemic (Kim et al., 2021; Peng & Chen, 2021; Dedeoglu & Bogan, 2021; Luo & Xu, 2021; Wang et al., 2021).

Further, Figure 6 shows the comparison of the 11 attributes' counts collected from customer reviews before (solid line) and during (dotted line) the Covid-19 pandemic.

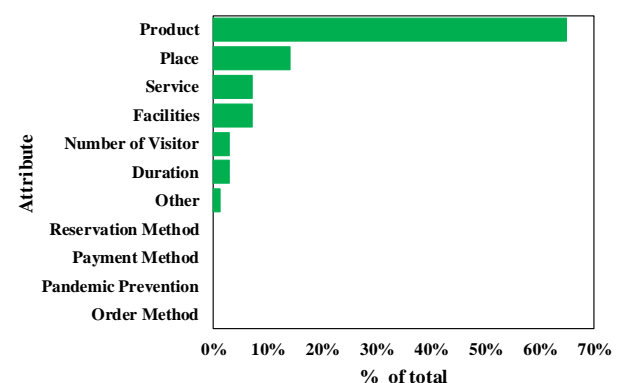


Figure 4. Result of Text Mining of Customer Reviews Before Covid-19 Pandemic

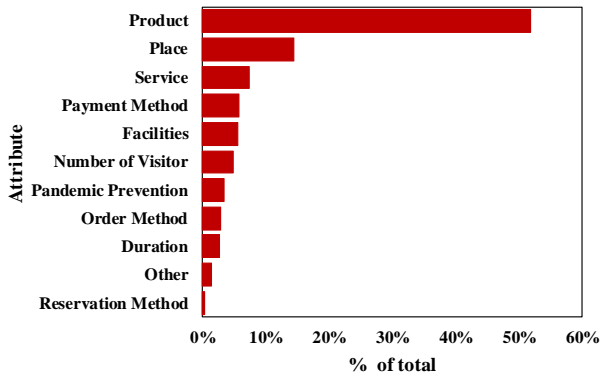


Figure 5. Result of Text Mining of Customer Reviews During Covid-19 Pandemic

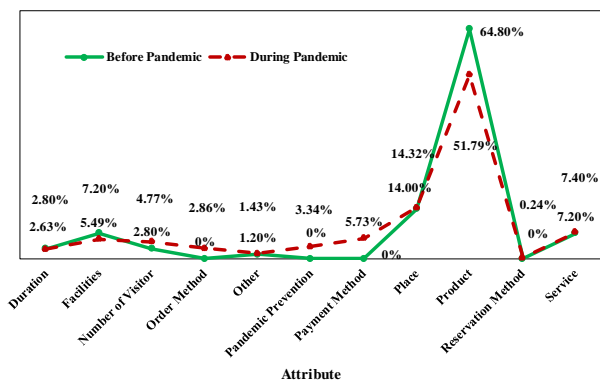


Figure 6. Difference of Review Attributes Before and During the Pandemic

The data difference before and during Covid-19 pandemic indicates three phenomena: (1) the appearance of products, facilities, and duration increases; (2) the appearance of the other attributes – place, service, other, and the number of visitors – decreases; (3) the remaining attributes did not exist before the Covid-19 pandemic and appear during the Covid-19 pandemic, i.e., payment method, order method, reservation method, and pandemic prevention. During the pandemic, people avoid physical interaction, so that the ways to pay, order, and making a reservation are changed from mostly manual to using information technology.

As shown in Figure 6, during the pandemic – although the appearance is decreasing – the product is still the most apparent attribute. In other words, the product, which includes taste, menu, portion, food quality, and price, is still in the customer’s top-of-mind. The new attributes that appeared in customer reviews during the pandemic show the new customers’ preference about food sellers in the pandemic situation, i.e., the needs of the change of how food selling operated and managed, and the customers’ concern in the pandemic situation.

3.2 Customer Reviews Sentiment Analysis

Customer reviews can be positive or negative. Table 3 presents the percentage of the positive and negative reviews to the total reviews. The most negative

review attribute indicates the weakness of most food sellers sampled. In contrast, the most positive review attribute denotes their strength.

As presented in Table 3, product and place are the two most positive attributes before and during the pandemic. It indicates that there is no significant difference in the product and place-related performance of food sellers, from customers’ viewpoint. Duration, number of visitors, and service tend to shift to negative during the pandemic. It means that customers expect a change in how duration, number of visitors, and services are managed by the food sellers during the pandemic. Facilities are the only attribute shifted to positive during the pandemic. It probably only a few customers used food sellers’ physical facilities during the pandemic, so that the complaints about facilities are, accordingly, reduced. Payment method, order method, reservation method, and prevention are pandemic-related attributes and tend to be positive according to customer perception. The need for new reservation methods and prevention are also discussed in other studies (Peng & Chen, 2021; Chang et al., 2021; Wang et al., 2021; Yu et al., 2021). Payment method is a unique finding from this study. Similar studies in other countries did not discuss the payment method, because – different from the phenomena in Indonesia – the people in that countries have already utilized technology-based payment before the Covid-19 pandemic.

Table 3. Percentage of Positive (+) and Negative (-) Reviews Before and During Pandemic

Attribute	Before Pandemic		During Pandemic	
	+	-	+	-
Payment Method	0.00	0.00	5.25	0.48
Order Method	0.00	0.00	2.39	0.48
Reservation Method	0.00	0.00	0.24	0.00
Duration	2.79	0.00	2.39	0.24
Facilities	4.38	2.79	4.77	1.43
Number of Visitor	2.39	0.40	3.58	1.19
Other	0.80	0.40	0.48	0.95
Prevention	0.00	0.00	3.34	0.00
Product	55.78	9.16	43.44	8.35
Service	6.37	0.80	4.53	2.86
Place	12.35	1.59	11.69	1.91

3.3 Gap Analysis Between Positive and Negative Review

Furthermore, the gap between the negative and positive reviews of an attribute can be interpreted as the domination of the strength (positive) or weakness (negative) of the food sellers in the aspects included in the attribute. A wide gap between positive and negative review attribute means there is a dominant status of the attribute, strong or weak. The narrow gap indicates a wide variety of the status of an attribute. These phenomena are pictured using the gap of sentiment analysis, as shown in Figures 7 and 8.

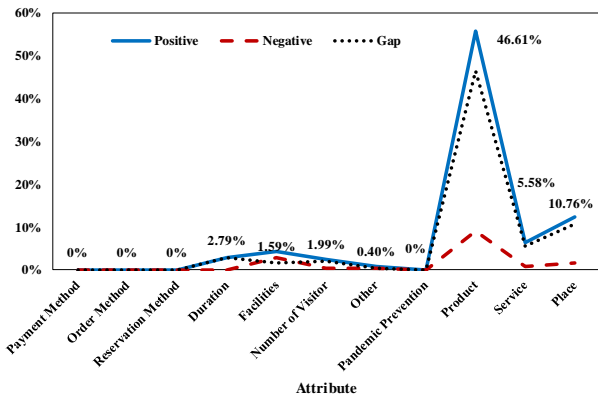


Figure 7. The Gap of Sentiment Analysis of Customer Reviews Before the Pandemic

Before the Covid-19 pandemic, product, place, and service are the top three positive attributes, while the top three negative attributes are product, facilities, and place. Facilities, the top negative but not included in the top positive, should be the concern for many food sellers in managing their business. From some reviews before the pandemic, customers that do dine-in needed better facilities than they experienced. For instance, customers mentioned the need for a bigger space for parking and the need for a good view to take selfie photographs.

The attribute with the widest positive-negative gap is product, place, and service. The positive reviews are the largest in all those attributes. Thus, it can be concluded that product, place, and service are already good for most food sellers. The attributes with the narrowest gap are facilities, number of visitors, and duration. It means that many food sellers still should give efforts to increase the performance related to the three attributes. Before the pandemic, there is no attribute with negative comments more than the positive ones.

The sentiment analysis of customer reviews during the Covid-19 pandemic is shown in Figure 8. Product, place, and service are still the most positive attributes as before the pandemic. Other attributes having positive reviews as high as service attributes are facilities and a new attribute of payment method. These attributes are closely related to the pandemic condition. During the pandemic, customers are concern about physical distancing, cashless payment, and online ordering to avoid crowds, which requires a new method of payment. The most negative attributes are the same as the ones before the pandemic, i.e., product, place, and service. It indicates that these three attributes are always the negative top-of-mind, no matter before or during the pandemic. There is a small gap between positive and negative reviews in some pandemic-related attributes, i.e.: order method, duration, number of visitors, and service. It shows that during the pandemic, there is still a need for improvement in food sellers' performance on those four pandemic-related attributes.

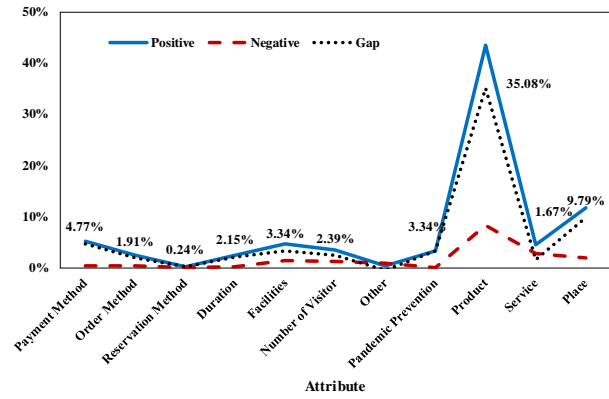


Figure 8. The Gap of Sentiment Analysis of Customer Reviews During the Pandemic

The 'other' attribute category has a higher negative review than the positive review. It can be explained by analyzing some customer reviews. They, in general, are related to the system reliability that is agitated by the pandemic. Some examples could be mentioned are: (a) The consistency of food sellers' service during the pandemic is worse than before the pandemic; (b) Some customers are disappointed with the food seller's staff hospitality to online delivery partners; (c) The high online demand that needs different treatment and services, on one hand, and the decrease of total demand that affect staff income, on the other hand, can create a stressful situation, and herding them to perform improper customer services.

3.4 Customer Reviews Gap Analysis Before and During Covid-19 Pandemic

In order to analyze the priority of strategy change that should be performed by the food sellers, a gap analysis of the reviews before and during the Covid-19 pandemic is conducted. The gap analysis is performed for positive reviews and negative reviews separately. The gap of customer reviews before and during the Covid-19 pandemic is shown in Figure 9 for positive reviews and Figure 10 for negative reviews.

As presented in Figure 9, the negative gap of positive review on duration, product, service, and place, indicates that customer satisfaction on those four attributes decreases because of the Covid-19 pandemic situation. Thus, evaluation on duration, product, service, and place should be carried out and the related improvements should be performed. Although the product attribute's positive review decreases during the pandemic, the product attribute is still the top issue for customers in deciding to buy food. Place attribute's positive review decreases during the pandemic because many food sellers cannot open the dine-in service due to physical distancing regulation.

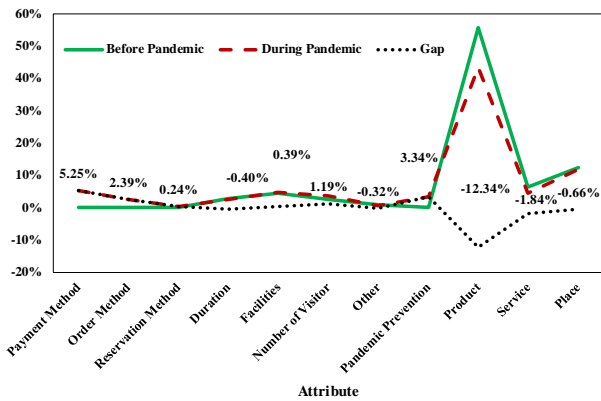


Figure 9. The Gap of Positive Review Before and During the Pandemic

The increase of positive reviews is related to facilities and the number of visitors. The concern of both food sellers and customers in implementing pandemic prevention limits the number of customers visiting the resto for dine-in, and it makes the resto roomy. The increase of positive reviews on facilities during the pandemic is caused by – as described in some reviews – customers’ appreciation of WiFi connection service in some food sellers, availability of handwashing facilities to prevent costumers from viruses, and availability of alternate workplaces.

The negative review gap before and during the Covid-19 pandemic is shown in Figure 10. The attributes with a positive gap on negative reviews, or in other words the attributes being worse during the pandemic, are duration, number of visitors, service, and place. During the pandemic, some customers complained about the duration of the food seller’s open time that was shorter than before the pandemic.

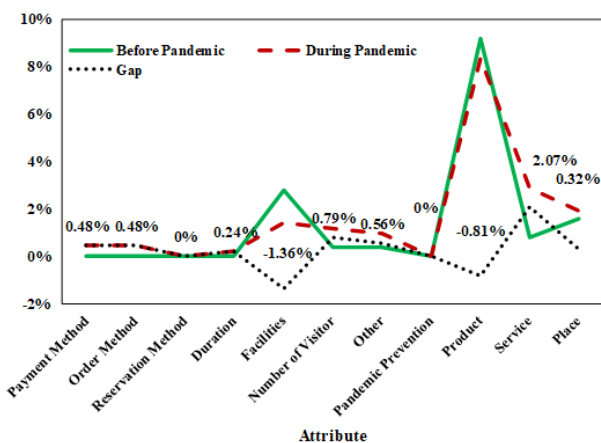


Figure 10. The Gap of Negative Review Before and During the Pandemic

The decrease of negative reviews, or the improvement of performance during the Covid-19 pandemic, is related to facilities and product attributes. It leads to a conclusion that the customers complain about facilities and products during a pandemic is less than before the pandemic, so that food seller should not too much worry about the improvement of these attributes.

Some new attributes that appeared during the pandemic are payment method, order method, reservation method, and pandemic prevention. Related to payment methods, food sellers have to serve a cashless method to prevent virus transmission from money. Due to physical distancing, some cities’ governments do not allow customers to dine in so that some customers prefer to order online. Thus, if the food sellers have no opportunity to develop their own online ordering system and delivery service, they should collaborate with online platform partners. During the pandemic, some food sellers which are still open dine-in should serve technology-based reservation methods such as using QR-code scanning to control the number of visitors at a certain time. To prevent virus transmission among customers, food sellers have to implement pandemic prevention suggested by WHO such as wearing personal protective equipment (both for the food seller staff and the customer), providing hand sanitizer, implementing physical distancing, and establishing health protocol.

3.5 Online Competitor Growth

Customers review analysis in the previous parts shows the tendency of online activities in food selling because of pandemic situations. This part discusses the competition in online selling, to portray both the opportunity and the competition tightness of selling food using online platforms. A number of 113 samples of food sellers in Tokopedia are observed to identify their dates of establishment, and 110 samples of non-food (shoe) sellers are also identified. The average number of sellers established every month found in the sampling process is taken as a growth score. The growth scores of food sellers before and during the Covid-19 pandemic are 2 and 9 on average, respectively. The non-food sellers’ average growth rate before and during the pandemic are 2 and 2, respectively. The profile of the growth scale of food sellers in Tokopedia marketplace from January 2019 to September 2020 is shown in Figure 11.

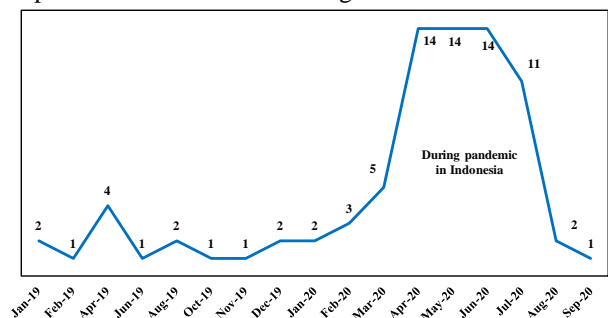


Figure 11. Monthly Growth Scale of Food Sellers in A Marketplace (January 2019–September 2020)

Figure 11 clearly illustrates the significant increase in the growth of online food sellers during the pandemic. The significant increase in the number of food sellers in the marketplace shows that: (a) many food sellers expand their business to online platforms; and/or (b) there are many new food sellers established during the pandemic.

Point (a) denotes the opportunity for food sellers to expand their business to an online platform. Point (b) indicates a tighter competition so that food sellers have to strengthen their business to win the market. It should be further analyzed by considering the future trend and mapping market saturation.

4. Conclusion

A text mining on food sellers' customer reviews before and during the Covid-19 pandemic shows that the customers' needs and perceptions can be classified into 11 attributes, i.e., payment method, order method, reservation method, duration, facilities, number of visitors, other, pandemic prevention, product, service, and place. The appearance of these attributes before and during the pandemic is different.

Keywords count shows that product, place, and services are always the customer's top-of-mind of food seller important attributes in Indonesia, no matter in normal or pandemic situation. Therefore, food sellers should always maintain their strength on those attributes. This finding is different from other studies in other countries, which found that the customers' top-of-mind attributes during the pandemic are safety-related attributes. The attributes that getting worse in the pandemic are open time duration and number of visitors, caused by activities restrictions stated in government regulation. The food sellers should try to find a new way to sell their products, for example, by using an online platform or partnering with a food delivery service.

The new pandemic-related attributes that should be considered by food sellers are technology-related attributes mentioned in customer reviews, i.e., payment method, order method, and reservation method. Customers want the use of the online method to do those activities. Compared to other studies (Kim et al., 2021; Peng & Chen, 2021; Dedeoglu & Bogan, 2021; Luo & Xu, 2021; Wang et al., 2021), a new finding in this research is the need for flexible and technology-based payment methods, to avoid physical contact. In other studies, this aspect was not discussed because that type of payment method is already applied in the countries where the research was carried out, long time before the pandemic.

The other attribute to be considered is pandemic prevention. The balance of positive and negative reviews on those pandemic-related attribute illustrates the variation of food seller's readiness in facing the pandemic in Indonesia.

Related to competition, the food sellers in Indonesia are suggested to expand their business through online platforms, while maintaining their strengths and improving their weaknesses to win the market.

Even though the end of the Covid-19 pandemic still cannot be predicted, many researchers believe that the new behavior of people during the pandemic will be continued in the new normal after the pandemic. Food

sellers' strategy in the new normal will not be the same anymore as the previous normal before the pandemic. Hence, further research will be carried out is to evaluate all aspects of food sellers' strategies to develop a predictive model for the post-pandemic period.

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