

## Research Article

# Analysis of Yogyakarta Coffee Shop Visitor Reviews to Increase Customer Satisfaction Using Sentiment Analysis

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## Abstract.

Visitor reviews written on Google Reviews can show the quality of a product or business. It can also indirectly be a promotion that attracts new consumers. There is a lot of information that can be processed from Google Review that is useful for improving business quality and customer satisfaction. One method that can be used to analyze review data is sentiment analysis. This study analyzed the reviews of coffee shop visitors in the Yogyakarta area written on Google Rewies using the Naïve Bayes Method. Visitor reviews were analyzed using sentiment analysis to see if visitor reviews tend to be positive or negative. Coffee shop business voters can see the level of customer satisfaction and find out what things need to be maintained and improved to increase customer satisfaction. The results of the sentiment analysis showed that more words were detected as positive than negative. Coffee shop visitors in Yogyakarta showed more positive emotions about their experiences when visiting coffee shops, which means most visitors were satisfied with the services and products offered by coffee shop owners in Yogyakarta. Visitors most often wrote about good coffee, price, friendly, suitable, spacious parking, hanging out, comfort, food, service, taste, and working space. Thus, coffee shop owners should focus on those things to increase their customer satisfaction.

**Keywords:** visitor reviews, Google Reviews, sentiment analysis, customer satisfaction

## 1. Introduction

The increasing number of coffee shops is influenced by the existence of a new culture or habit of drinking coffee for young Indonesians, especially Generation Y and Z. The number of universities in Yogyakarta makes this city filled with students from various regions, this indirectly has a big influence on the development of coffee shops in Yogyakarta. According to statistical data in 2017, coffee shops in Yogyakarta reached 1,200 coffee shops. A large number of competitors in the same field then creates tight competition for the coffee shop business. Thus, coffee shop business owners must develop a good strategy to compete and benefit from their business.

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Customer satisfaction is one of the most important things for business owners to pay attention to. Tjiptono [1] states that consumer satisfaction is a situation shown by consumers when they realize that their needs and desires are as expected and well fulfilled. Business owners need to make sure that their customers are satisfied with their services or products so that they want to buy or use services again. With a large number of coffee shops in Yogyakarta, consumers have many choices for the coffee shop they want to visit and buy. Knowing the level of customer satisfaction can help coffee shop owners evaluate their businesses. Research shows that there is a strong relationship between customer satisfaction and customer loyalty, so it is necessary to manage customer experience [2, 3].

With current technological developments, consumers can express their satisfaction or complaints on the internet, such as through Google Reviews or TripAdvisor. The results of this review can be used by business owners to determine the level of user satisfaction with their products or services. However, with the many free reviews on the internet, it sometimes confuses business owners to find out the level of customer satisfaction. One method that can be used to manage this large number of review data is opinion mining. Opinion mining is a web mining technique to analyze the underlying sentiment of user-generated content such as online product reviews, blogs, discussion forums, etc. [4]. Opinion mining is sometimes referred to as sentiment analysis, which is the process of understanding, extracting and processing textual data automatically to obtain sentiment information contained in an opinion sentence [5]. Research using opinion mining has been done before and applies to many research objects, such as film reviews, food reviews, certain product reviews, tourist attractions, hotel reviews, etc. [6–13].

From this background, this study will analyze the sentiment of coffee shop reviews written by visitors on Google Reviews. Visitor reviews are analyzed using naïve bayes method to see if visitor reviews are likely to be positive or negative, and what keywords are most frequently mentioned by visitors in the reviews they write. So that coffee shop business voters can see the level of customer satisfaction and know what things need to be maintained and improved to increase customer satisfaction.

## 2. Methods

The method used in this research is data mining. Data mining is the discovery of the structure of interesting, unexpected, or valuable big data sets [14]. In this study, specifically using the opinion mining method or sentiment analysis. Sentiment Analytics

(SA) is a part of computer science, which works through the process of understanding and then extracting and processing textual datasets automatically [15]. SA works to get the information sentiment contained in the opinion sentence which is a subjective assessment [16]. Currently, the SA is working to see the tendency of opinions, namely a problem or object carried out by someone leads to positive or negative opinions and it could be that the opinions that appear are neutral so that they become decision support material.

Data processing in this research uses the R Studio software and the R programming language. The use of this software aims to determine sentiment analysis regarding reviews of coffee shop visitors in Yogyakarta.

The review data used in this study is the review data of coffee shop visitors in Yogyakarta which was obtained from Google Reviews of several coffee shops in Yogyakarta. The chosen coffee shop is a coffee shop with a rating above 4.5 with the consideration that the place has been visited and reviewed by many visitors. The reviews obtained by coffee shops that received ratings above 4.5 varied from positive to negative reviews so that they matched the data needed to evaluate the sentiments of coffee shop visitors. A total of 14 coffee shops were sampled in this study, with the reviews taken varied from reviews with 5 stars to 1 star. The selection of reviews or reviews that varied from 5 to 1 was to ensure that the data processed contained positive and negative reviews.

### 3. Result and Discussion

The amount of data obtained from this data collection or scrapping process is 123 data. Examples of review data or coffee shop visitor reviews obtained from Google Reviews can be seen in Table 1.

The next step is to do text preprocessing. The data obtained from Google Review is text data with an unstructured CSV file type. So, it is necessary to do the process of converting the form into structured data or cleaning the data called text preprocessing. There are several stages in text preprocessing, namely cleansing, tokenizing, filtering, and others. The stages in text preprocessing themselves vary depending on the data obtained and the purpose of processing the data for what.

The first text preprocessing in this research is cleansing. Cleansing is one of the stages of text preprocessing which aims to clean text from tabs, new lines, back slices, mentions, links, hashtags, and URLs. An example of applying cleansing to review data can be seen in Figure 1.

TABLE 1: Sample data for coffee shop visitors in Yogyakarta.

Id	Score	Text
1	5	Bagi yang gak mampu beli kopi mahal gak usah ke sini ya bos mending ke angkringan aja, dari pada kaget sama harganya, walupun tempatnya kecil tapi kalo cari kualitas kopi recomended banget ke ruang seduh jogja.
2	4	Walau tidak begitu besar, namun tempat ini cukup nyaman. Design interiornya minimalis dan didominasi dengan warna putih jadi terlihat terang jika dilihat dari luar.
3	5	Coffee shop dengan konsep minimalis serba putih yang berada di dalam Arkadia. Baristanya ramah, harga kopinya agak mahal namun sebanding dengan rasanya yang enak.
4	4	Berada di kawasan wisata Yogya, Ruang Seduh bisa jadi alternatif 'ngopi' plus meet up. Walaupun tempatnya kecil, namun nyaman. Dengan desain simple dengan clean bikin betah.
5	1	Overpriced coffee untuk jogja (latte 35k - 45k) dan pelayanannya lama sekali untuk pesan kopi dan donat aja. Dan ternyata lama karena baristanya ngobrol2 dulu $\delta\ddot{Y}^{TM}f$ kopi dan donatnya juga biasa aja $\delta\ddot{Y}^{TM}f$
6	4	Untuk ruang seduh, tempat kecil. Ada tempat dibagian belakang yang luas dan nyaman untuk kumpul-kumpul, tapi kalo siang hari terasa panaaaas.
7	4	Tempat yang minimalis dibalut dengan cat putih di seluruh ruangan. Kopi yang enak. Bahkan, kita diijinkan membuat kopi kita sendiri dipandu dengan baristanya, yang rasanya tetap enak. Tempat yang nyaman untuk ngopi dan ngobrol ringan.
8	3	Karna berada di Kawasan Turis mancanegara, harganya mahal (bagi pengangguran seperti saya). Harganya diatas 25 Ribu semua. Tempatnya kecil, bahkan ditempat yg harganya mahal dan ber-AC masih ada Nyamuk. Di desain untuk nugas, tapu wifinya lambat. Selain lambat koneksinya putus-putus.
9	5	Tempatnya tenang, bersih dan kopinya enak banget
10	5	Tempatnya nyaman, parkir mobil dan motor cukup banyak tersedia. Harga kopinya menurut saya rwlatif murah, rasanya pun juga enak.

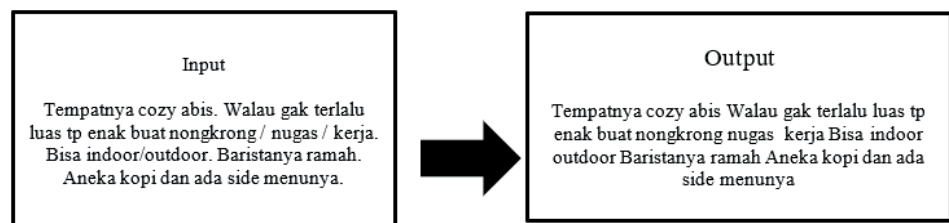


Figure 1: Example of data cleansing process.

Case folding is a stage in text preprocessing that aims to convert all letters in the document into lowercase letters (lower text). An example of the application of case folding on review data can be seen in Figure 2.

Remove number is a text preprocessing stage that aims to clean text from numbers. An example of applying to remove numbers to review data can be seen in Figure 3.

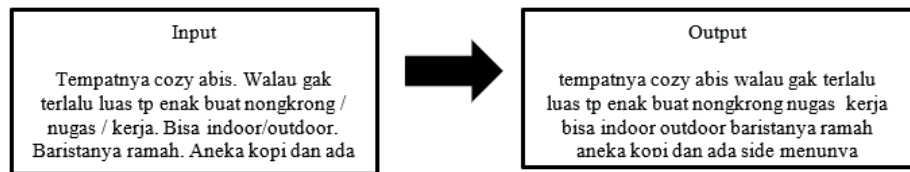


Figure 2: Example of case folding process.

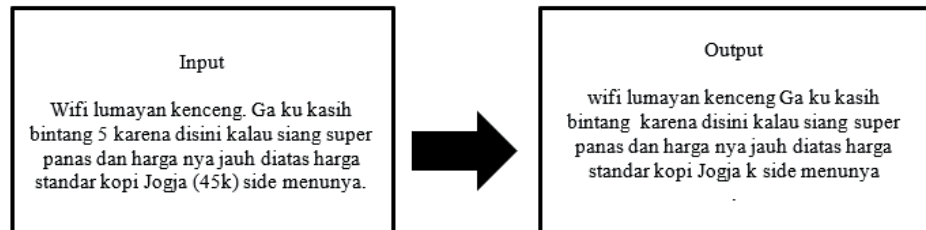


Figure 3: Example of remove number process.

Filtering is a text preprocessing stage that aims to clean text from stop words. Stop words are words that have no meaning. Examples of stop words in English are “the”, “and”, “but”, “if”, “or”. And because the review language used is Indonesian, an additional script is needed to remove stop words in Indonesian such as “dan”, “karena”, “lumayan”, etc. An example of a filtering process to review data can be seen in Figure 4.

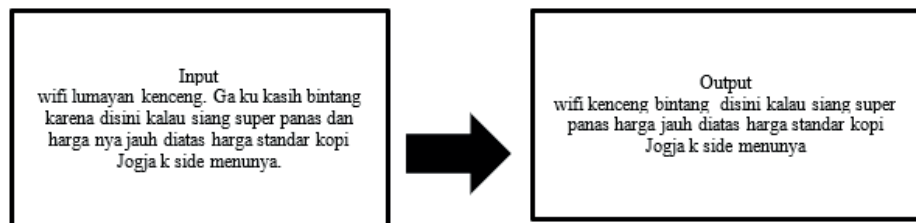


Figure 4: Example of filtering process.

Remove punctuation is a text preprocessing stage that aims to clean text from punctuation marks. An example of applying remove punctuation to review data can be seen in Figure 5.

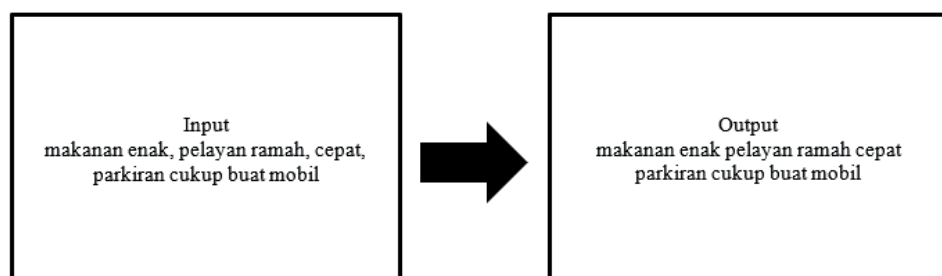


Figure 5: Example of remove punctuation process.

After cleaning up the text data, the next step is to count the occurrences of each word, to identify topics that are popular or trending. Use the TermDocumentMatrix() function to build a Document Matrix – a table containing word frequencies. The script is used to find the 10 most frequently appearing words from the review data. The words that appear most frequently from the review data can be seen in Table 2.

TABLE 2: Frequently appearing words from review data.

Word	Frequency
kopi	61
enak	59
nyaman	42
harga	29
ramah	24
luas	23
kopinya	21
nongkrong	21
parkir	18
cocok	18

From this data, a visualization can be made. The purpose of visualization is to extract information in the form of topics that are most frequently discussed or reviewed by coffee shop visitors in Yogyakarta so that from the many available review texts, information that is considered important can be taken. In this study, the results were visualized using bar charts and word clouds regarding the most frequently occurring words from the review data. The visualization output in the form of bar charts and word clouds can be seen in Figure 6.



Figure 6: Bar chart (a) and word chart (b).

The next step is to perform sentiment analysis on the review data. Sentiments can be classified as positive, neutral, or negative. They can also be represented on a numerical scale, to better express the degree of positive or negative strength of the sentiment contained in the body of the text.

This study uses the Syuzhet package to generate sentiment scores, which has four sentiment dictionaries and offers a method for accessing the sentiment extraction tool developed in the NLP group at Stanford. The `get_sentiment` function accepts two arguments: a character vector (a sentence or a word) and a method. The method chosen determines which of the four available sentiment extraction methods to use. The four methods are `syuzhet` (this is the default), `bing`, `afinn`, and `nrc`. Each method uses a different scale and therefore returns slightly different results.

The total number of words detected for each emotion can be seen in Figure ?? which is the output of the previous script results. It can be seen in Figure ??, that the results of the sentiment analysis show that more words are detected as positive than negative. This means that the review data of coffee shop visitors in Yogyakarta showed more positive emotions about their experiences when visiting coffee shops. This data shows that more visitors are satisfied with the services and products offered by coffee shop owners in Yogyakarta.

The next step is to create a plot diagram to help visually analyze the emotions in the survey text. First, perform some data transformation and cleanup steps before plotting the graph. The plot shows the total number of word examples in the text, which are associated with each of the eight emotions. The plot can be seen in Figure 7.

	sentiment	count
1	anger	11
2	anticipation	17
3	disgust	9
4	fear	8
5	joy	14
6	sadness	10
7	surprise	9
8	trust	20
9	negative	20
10	positive	56

**Figure 7:** Amount of each emotion.

From Figure 7 it can be seen that the results of the reviews of coffee shop visitors in Yogyakarta showed the most emotions of trust, anticipation, and joy. The three dominant emotions tend to show positive emotions. This means that the level of

visitor satisfaction with coffee shops in Yogyakarta is good. From processing with sentiment analysis, it can't show the percentage level of visitor satisfaction, so other additional methods are needed to determine the percentage level of visitor satisfaction. However, from these results, it can be seen that more reviews show positive emotions than negative emotions.

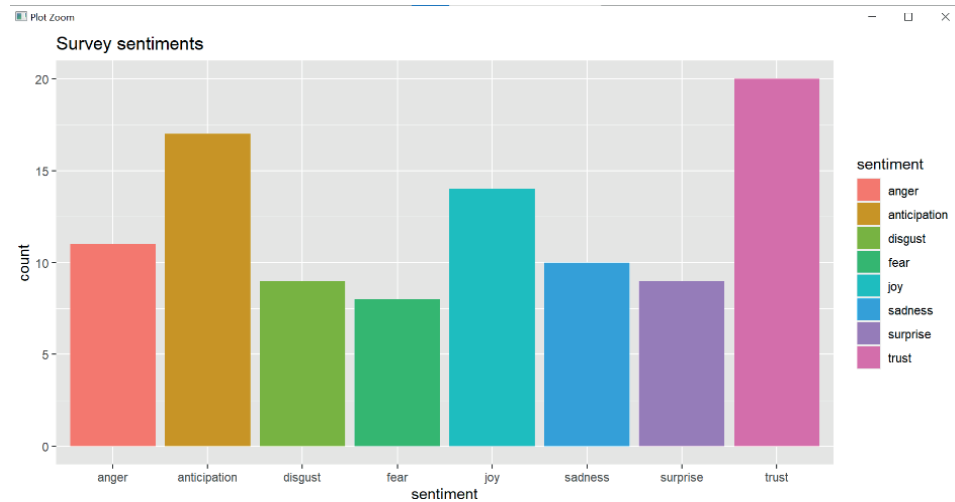


Figure 8: Sentiments analysis diagram.

From the results of the processing that has been carried out, it shows that more visitors write positive reviews than negative. Figure 6 shows that visitors most often write about good coffee, price, friendly, suitable, spacious parking, hanging out, comfortable, food, service, taste, and nugas. From these keywords we can conclude that some important things to note are as follows:

1. Good coffee. Of course, this is something that coffee shop owners absolutely must provide. However, the development of the coffee shop business today requires owners to be creative in creating variations of a unique coffee drink menu but still delicious to enjoy.
2. Convenient place. The word comfortable appears 42 times, being in position 3 the most mentioned from the review data obtained. So a comfortable coffee chop arrangement is the second important criterion for coffee shop owners to pay attention to so that more visitors come to their place of business. A comfortable place can also make visitors feel at home to linger in the coffee shop, which also has the potential to increase sales levels. Because the longer visitors are in the coffee shop, is directly proportional to the level of repurchase of the menu provided.



3. An affordable price. Price is the fourth most mentioned word in visitor reviews. Because Yogyakarta is a student city, many coffee shop consumers also come from this circle. Changes in student culture are also happening at this time when many students choose to do assignments at the coffee shop. In addition to studying, they also hold many meetings or meetings related to student activities. This is proven by the number of nugas and hang-out words that appear in the review data.

Friendly service or baristas. The review data, shows reviews with low ratings are dominated by reviews of visitors who feel disappointed with the service of the barista who feels unfriendly. Because coffee shop owners need to make sure the workers and baristas serve visitors well and are friendly.

## 4. Conclusion

1. Data reviews of coffee shop visitors in Yogyakarta show more positive emotions than negative ones. The three most common emotions include trust, anticipation, and joy.
2. Things that need to be considered by coffee shop owners to increase customer satisfaction include good coffee taste, comfortable places, affordable prices, and friendly waiters or baristas.

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