Analyzing Consumer Online Reviews for Enhancing Restaurant Marketing Strategy: Applying the 7Ps Marketing Mix Framework

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Abstract: This research aims to investigate the elements of the marketing mix that exert the greatest influence on the preferences of restaurant patrons and analyze how these elements are articulated in online reviews on Google Maps Reviews, as well as their implications for customers' perceptions of quality and the development of loyalty. The analysis employs a framework comprising seven marketing mix elements to scrutinize consumer appraisals. Textual analysis and descriptive statistics are employed to discern disparities in the dimensions of the marketing mix elements. The findings reveal that customers of restaurants predominantly discuss the product and price elements, whereas the remaining elements, namely place, promotion, process, people, and physical evidence, garner a lower percentage of discussions and are only mentioned in relation to specific ratings. These discoveries yield valuable insights for business management and can assist enterprises in enhancing their marketing strategies. Theoretically, this study enriches the marketing literature and furnishes novel perspectives for practical business decision-making. Furthermore, the research findings can be leveraged to design employee training programs and refine operations in order to bolster the quality of products and services rendered by food and beverage establishments.

Keywords: online reviews; restaurant; marketing mix; text analysis.

INTRODUCTION

In today's era of advanced technology and information, websites that enable users to express opinions and evaluate products have gained increasing popularity among the general public, particularly with the growing adoption of smartphones and other mobile technologies. Within the restaurant industry context, online reviews have become an indispensable tool for consumers when it comes to selecting which restaurants to visit. So that this affects consumer decision making. Consumer decision making is also related to making decisions regarding product and service offerings [21].Additionally, online reviews significantly impact restaurant business management by providing insights into customer experiences and evaluations of the company's products and services [1].

Consumer evaluations derived from online reviews possess the potential to assist company management in identifying and addressing shortcomings resulting from customer complaints. Conversely, positive evaluations can aid companies in formulating strategies to enhance customer loyalty [2]–[4]. Therefore, information obtained from customer evaluations posted on the internet holds considerable value for companies as it serves as one of the primary sources of feedback to enhance performance and ensure the long-term sustainability of the business.

Nevertheless, it is important to note that research pertaining to online reviews in the restaurant context remains relatively limited. Schuckert et al. [5] concluded that only approximately 18% of the total 50

reviewed articles spanning nine years (2004 to 2013) discussed themes related to restaurants and food service, while articles related to hotels accounted for 60%, and the remaining articles covered travel (18%) and other topics (4%).

Based on our initial search results conducted on February 8, 2022, utilizing the Scopus database via Publish or Perish, only 47 articles (31%) were found pertaining to the topic of "restaurant" and "online reviews" published between 2021 and 2022. In contrast, a search with the same title and the keyword "hotel" yielded 104 articles (69%). Although the number of articles found has increased significantly, research related to restaurants still remains relatively limited compared to research on hotels [6].

Research on evaluating the quality of customer experiences in restaurant environments utilizing the 7P marketing mix remains limited, particularly in determining the most relevant dimensions of the marketing mix to measure quality and drive customer loyalty [7]. Research that links customer satisfaction with customer loyalty is research conducted on [22] and [23]. However, several instruments have been developed by researchers to measure service quality in customer service fields. For instance, SERVQUAL [8]–[10] and DINESERV [11] are designed for evaluating service quality. Moreover, DINESERV.PER represents a modification of the original DINESERV questionnaire that incorporates a performance-based approach to quality measurement introduced by Keith and Simmers [12]. Additionally, Raajpoot [13] proposed the TANGSERV scale, while Ryu et al. [14] developed a multi-item scale named DINESCAPE to assess the physical environment in upscale restaurant settings. However, Kukanja et al. [7] contend that all these instruments primarily focus on service delivery and employ traditional questionnaire survey techniques. Unfortunately, within the context of the restaurant industry, there remains a dearth of studies utilizing open-source information sources such as user-generated content (UGC) in the form of online reviews.

The primary objective of this research is to explore the marketing mix elements that most frequently capture customers' attention utilizing the framework of the seven marketing mix elements (product, price, place, promotion, people, process, and physical evidence). Furthermore, this study aims to identify the terminology employed by consumers to describe their dining experiences at restaurants based on the assigned rating classifications and to ascertain the disparities in marketing mix dimensions that influence customer perceptions of quality and the development of loyalty in restaurants. Consequently, this research provides two main contributions. First, it underscores the influence of marketing mix dimensions on customer perceptions of quality and the development of loyalty in restaurants, thus augmenting the knowledge of business practitioners within the restaurant context. Second, this research demonstrates how the utilization of unstructured text derived from user-generated online reviews can yield fresh insights for business management [3], [4], [15]. The methodological implications of the research findings utilizing the 7P marketing mix framework can assist restaurant owners or management in devising relevant differentiation and positioning strategies to foster the growth of their businesses. Furthermore, this research also contributes to the evolving knowledge and practice of employing online reviews in academic research.

In contrast to prior research that relied on questionnaire surveys for gathering customer responses, current research depends on online reviews generated by customers to identify their levels of satisfaction and dissatisfaction through free-text and numerical information, thereby facilitating the development of pertinent marketing strategies within the restaurant industry. Consequently, this study introduces a relatively new method for analyzing online consumer evaluations based on the seven components of the marketing mix (7P) using textual analysis.

This paper comprises five sections. Following the introduction of the topic in the opening section, section two will briefly outline relevant literature reviews pertaining to the research topic. Section three will elucidate the techniques and research procedures employed for collecting and analyzing data in this study. Furthermore, section four will provide a comprehensive discussion of the research findings and results. Sections five will explore the conclusions and implications of the research findings, as well as delineate the limitations and propose suggestions for future research. Consequently, this paper will offer a comprehensive overview of the research topic and its contribution to knowledge within the relevant field.

METHOD

Data Sources and Research Object

As mentioned earlier, this study has two main objectives. Firstly, it aims to explore the marketing mix elements that most capture customers' attention using the framework of the seven marketing mix elements (product, price, place, promotion, people, process, and physical evidence). Secondly, it seeks to identify the language used by customers to describe their dining experiences in restaurants based on the ratings given and to determine the impact of marketing mix dimensions on perceptions of quality and the development of customer loyalty in restaurants.

The data source for this research is customer reviews posted on the Google Maps website for Kebalen Cafe. This website allows users to write reviews and express their opinions about places they have visited, including Kebalen Cafe. In this study, all reviews posted on the website are processed and analyzed using text analysis techniques. A total of 686 reviews were used as the data source. As customers who have purchased food or drinks at Kebalen Cafe are entitled to provide reviews on the website, the reviews generated can be considered more accurate. All reviews available on the website are accessible to the public, allowing every customer who visits the restaurant to contribute a review based on their personal experience.

The data collection and processing process took place in January 2022, utilizing three tools: Instant Data Scraper and Microsoft Excel for data collection and processing, and JMP Pro 14 for advanced analysis [3], [4]. In this study, text analysis techniques will be employed to explore and analyze the marketing mix elements, including product, price, place, promotion, people, process, and physical evidence.

Data Collection, Processing, and Analysis Procedures

The data collection, processing, and analysis procedures employed in this study involve several steps. The following are the detailed steps of the procedures used in this study [3], [4]:

- Identifying the data source

   The researcher identified the Google Maps Reviews website as the ideal data source for collecting customer reviews. This website was chosen due to its accessibility and provision of relevant and up-to-date information about restaurants.

- Data collection with Instant Data Scraper

   Instant Data Scraper was utilized to automatically collect data from the Google Maps Reviews website. Instant Data Scraper is a Google Chrome extension that enables users to extract data from websites without the need for programming. In this case, Instant Data Scraper was directly connected to Google Chrome and employed for automatic data collection.

- Data extraction to XLSX format

   Upon completion of data collection with Instant Data Scraper, the results were exported to XLSX (Excel) format. This format was chosen for its user-friendliness and facilitation of data cleaning and organization.

- Cleaning and organizing data

   The data extracted from the Google Maps Reviews website was then cleaned and organized using Excel. This step aimed to eliminate duplicates, correct writing errors, and remove irrelevant information from the data used in the study. Additionally, Excel was utilized to convert text information into numerical form, simplifying data processing and enabling further analysis using JMP Pro 14. For instance, Excel formulas were employed to automatically count the number of words used by each reviewer. The resulting numerical data could then be presented in the form of graphs or visualizations, enhancing comprehension.

- Data analysis with JMP Pro 14

   After the data was cleaned, selected, and transformed into numerical form, detailed analysis was performed using JMP Pro 14 to obtain comprehensive insights. During this analysis stage, distribution analysis was conducted to present information about total reviews, ratings, likes, total photos, photo

contributions, review content, response content, number of review words, and number of response
words. This distribution analysis assists researchers in identifying patterns or trends in the data and
gaining a deeper understanding of the variables under investigation.

The data collection procedure described above ensures the validity and accuracy of the data used in the study.
By employing technologies such as Instant Data Scraper, Excel, and JMP Pro 14, the process of data collection,
processing, and analysis is expedited. This allows researchers to focus on more in-depth data analysis and
generate more meaningful research outcomes.

RESULTS AND DISCUSSION

In the initial stage of the research, three variables contributing to customer online reviews were
categorized, namely the number of photo contributions, ratings, and word count in the reviews [16]–[18].
This study revealed that despite the brevity of most customers' reviews regarding their dining experience,
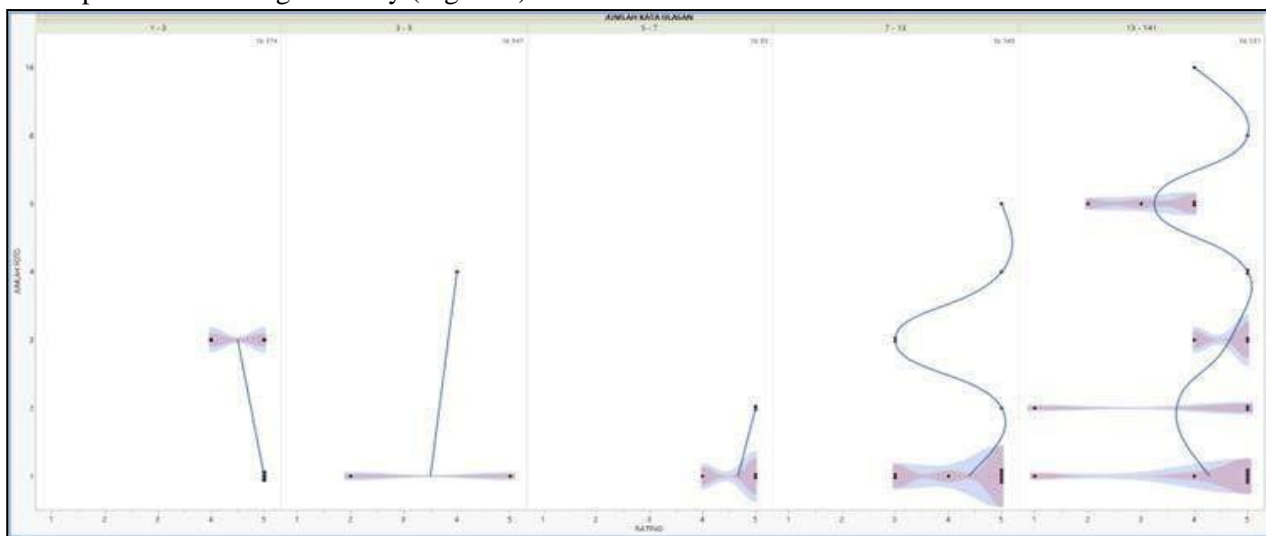their opinions varied significantly (Figure 1).

Figure 1. Correlation of number of photos, rating, and word count of reviews.

For reviews with 1-2 words and ratings of 1, there were 5 reviewers; for ratings 2, there were 5
reviewers; for rating 3, there were 24 reviewers; for rating 4, there were 31 reviewers; and for rating 5, there
were 111 reviewers, each providing 1-3 photo contributions. In the case of reviews with 3-4 words and ratings
ranging from 1 to 5, there were 4 reviewers for rating 1; for rating 2, there were 3 reviewers; for rating 3,
there were 9 reviewers; for rating 4, there were 27 reviewers; and for rating 5, there were 104 reviewers, each
contributing 1-4 photos. Reviews containing 5-6 words had 1 reviewer for rating 1, 2 reviewers for rating 2,
10 reviewers for rating 3, 23 reviewers for rating 4, and 55 reviewers for rating 5, each providing 1-2 photos.
Furthermore, reviews comprising 7-12 words included 5 reviewers for rating 1, 1 reviewer for rating 2, 17
reviewers for rating 3, 33 reviewers for rating 4, and 88 reviewers for rating 5. Lastly, reviews containing 13-
141 words involved 9 reviewers for rating 1, 4 reviewers for rating 2, 16 reviewers for rating 3, 30 reviewers
for rating 4, and 71 reviewers for rating 5, each contributing 1-16 photos.

Based on the findings from the categorization, it can be concluded that as customers utilize more words
and share more photos in their reviews, the likelihood of their satisfaction with the restaurant's products or
services increases. Specifically, reviews accompanied by a greater number of photos tend to indicate positive
experiences. However, it is important to note that this pattern may not apply to all customers due to the limited
number of reviews in the utilized dataset.

Operationally, reviewer contributions can be defined as the level of engagement or personal experience
they bring forth in their reviews of a place. This encompasses the number of shared photos, total reviews, and
various other components. Figure 2a depicts the distribution of shared photos among different reviewers,

highlighting their dining experiences at various restaurants or locations. The group of reviewers who shared 0-25 photos constitutes 58% of all reviewers, while the group of reviewers who shared 26-50 photos comprises 12% of the total. Additionally, there are groups of reviewers with photo shares ranging from 51 to 175, each representing 7%, 5%, 3%, 3%, and 2% of all reviewers, respectively. The group with the highest number of photos (1-25) consists of 297 photos, whereas the group with the fewest photos (301-325) only includes 2 photos. This illustrates that reviewers with a greater number of photos exhibit more experience in providing reviews.

Figure 2b portrays the distribution of reviews owned by different reviewers, encompassing online reviews generated by reviewers for each place they have visited. The graph indicates that the majority of reviewers possess between 0 and 20 reviews, amounting to 356 reviewers (52%). This is followed by reviewers with 21 to 40 reviews, while some reviewers have more than 40 reviews.

Figure 2c displays the contribution of the number of response words from restaurant management, categorized according to the number of words utilized in their responses (0-79). Within the category of (0-2) response words, 513 responses (75%) were recorded, whereas in the category of (17-20) response words, 52 responses (8%) were observed. This indicates that restaurant management tends to employ simple and easily comprehensible sentences when responding to customer reviews.

Figure 2d showcases the number of "likes" bestowed by other readers/reviewers on the reviews composed by users. These "likes" signify agreement with the comments made by other users, expressed through the act of leaving a "like." We categorized the contributions of "likes" based on the ratings given by the reviewers, ranging from 1 to 5. In the range of 1-2 ratings, 94 reviewers (79%) expressed their approval by giving a "like." For the range of 2-3 ratings, 19 reviewers (16%) awarded a "like." Only 2 reviewers (2%) granted a "like" for the range of 3-4 ratings, and for the range of 4-5 ratings, 4 reviewers (3%) indicated their endorsement.

Customers who write reviews on Google can express themselves through writing. Longer reviews tend to provide more information about products and services, along with specific details regarding the usage and context of the product [19]. As depicted in Figure 2e, the average number of words utilized by reviewers ranges from 1 to 10 words per review. This suggests that reviewers employ straightforward and easily understandable language when expressing their thoughts.
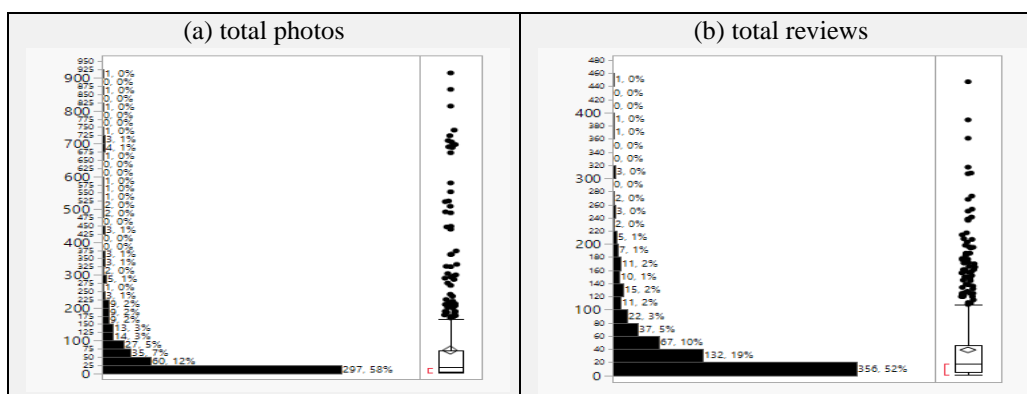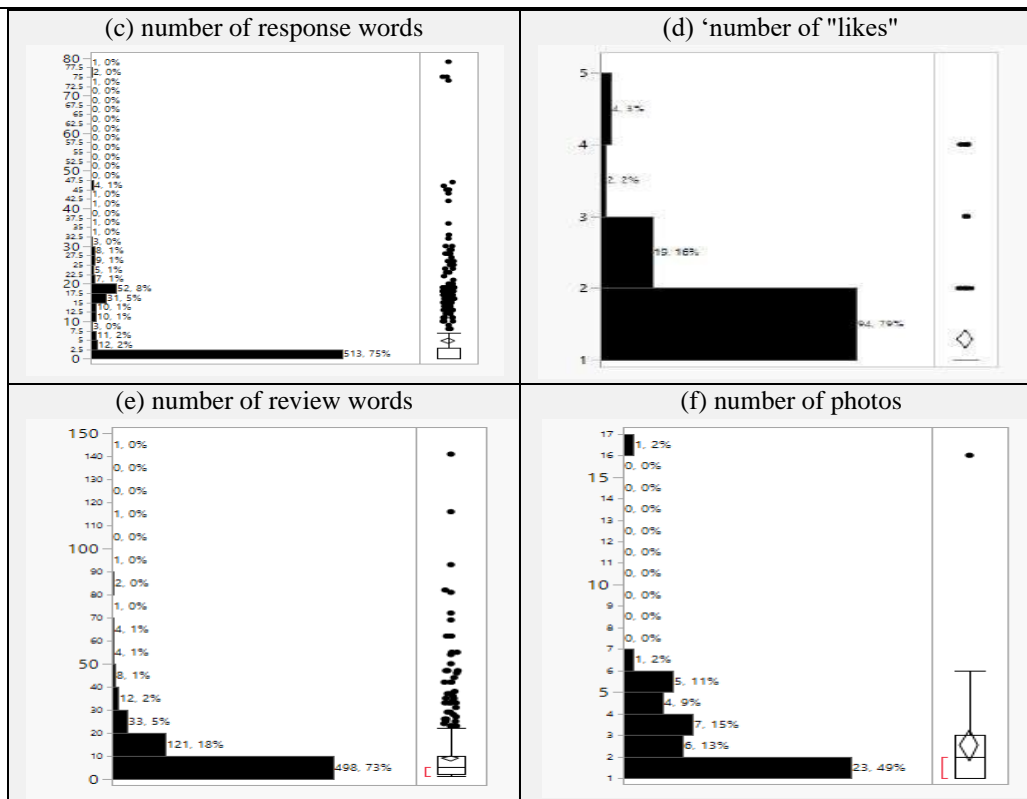
Figure 2. Shows the frequency distribution based on: (a) total photos, (b) total reviews, (c) number of response words, (d) number of "likes", (e) number of review words, and (f) number of photos

Figure 2f demonstrates the contribution of other reviewers in the form of uploaded photos accompanying their reviews. The number of uploaded photos falls within seven categories, ranging from 1 to 17 photos. The category of 1-2 photos garners the highest contribution, accounting for 23 reviewers (49%), followed by the category of 2-3 photos with 6 reviewers (13%), the category of 3-4 photos with 7 reviewers (15%), the category of 4-5 photos with 4 reviewers (9%), the category of 5-6 photos with 5 reviewers (11%), the category of 6-7 photos with 1 reviewer (2%), and finally, the category of 16-17 photos, represented by a single reviewer (2%). This suggests that reviewers incorporate photos into their reviews as additional visual aids to assist other customers in comprehending the content. Consequently, other customers have the opportunity to express their approval by leaving a "like" on the uploaded photos within the reviews.

Text analysis generated a word cloud visualization based on the online review data collected from the Kebalen Cafe website on Google Maps. Figure 3 presents the frequently occurring words in these online reviews. Larger words indicate higher frequency, while smaller words suggest infrequent mentions by reviewers.
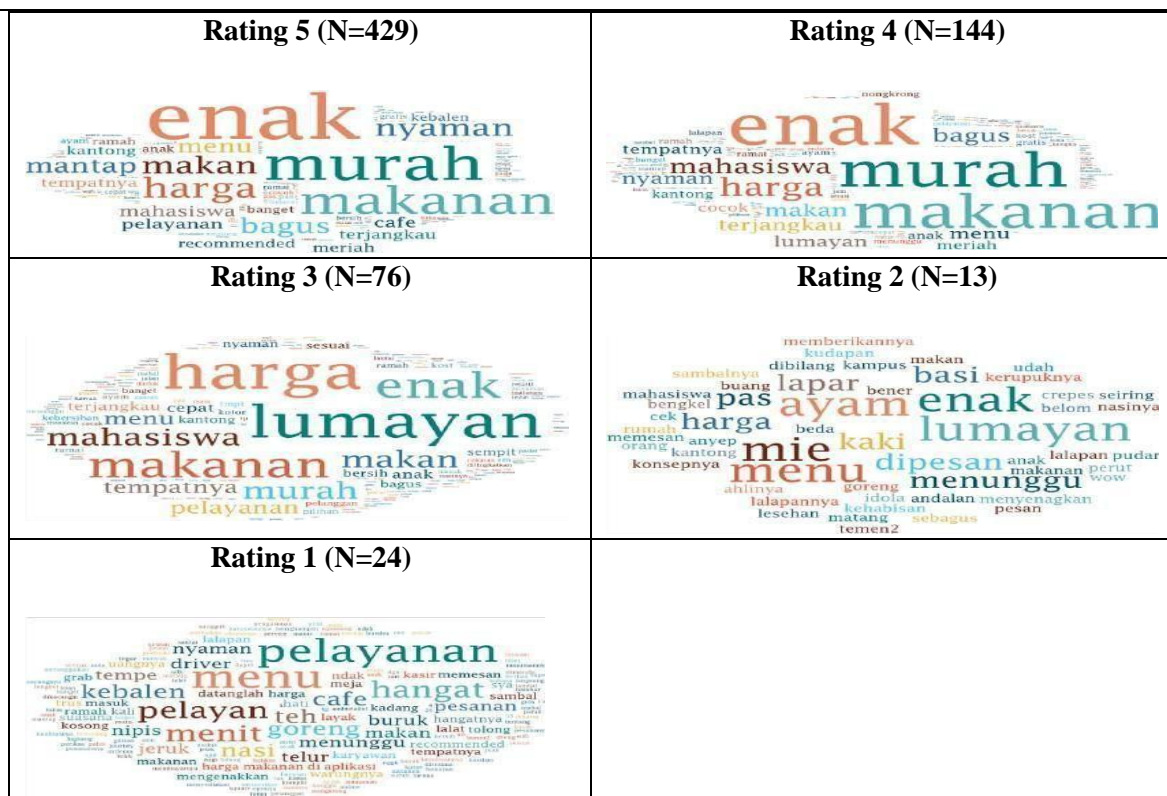
Rating 5 (N=429)	Rating 4 (N=144)
Rating 3 (N=76)	Rating 2 (N=13)
Rating 1 (N=24)	

Figure 3. Word cloud

The word cloud analysis illustrates the frequency of word occurrence in the text data, specifically online reviews, as depicted in Figure 5. In the all rating category, the word "enak" (tasty) related to "makanan" (food) appears prominently in the word cloud, with a frequency of 51 occurrences out of 686 cases. Similarly, the word "murah" (cheap) often associated with "meriah" (affordable) features prominently in the word cloud and appears 41 times. The word "harga" (price) linked to "terjangkau" (affordable) also holds a significant position in the word cloud, with a frequency of 27 occurrences. In the 5-star rating category, the word "enak" occurs 40 times out of 429 cases and is frequently associated with "makanan". The word "murah" is also commonly linked to "meriah" and is prominent in the word cloud with 30 occurrences. In the all rating category, specifically the 5-star rating, the word "enak" is frequently mentioned in relation to "makanan". In the 4-star rating category, the word "enak" appears 10 times out of 144 cases, and reviewers often comment on the taste of the restaurant's products. Among all the words and terms mentioned by reviewers, the word "mahasiswa" (student) holds a reasonably large position in the word cloud and is often associated with the word "harga" (price) in the 3-star rating category. This suggests that some reviewers are students. Additionally, in the 2-star and 1-star rating categories, reviewers tend to discuss the variety of menu options offered by the restaurant.

To avoid operationalization errors, where a sentence can be mistakenly categorized into multiple 7P models, we refined the definition of each 7P element to ensure specificity. We manually recorded these adjustments using Microsoft Excel, as depicted in Figure 4. For instance, we recognized that phrases like "makanan enak" (delicious food), "nasi goreng" (fried rice), and "menu pesanan" (ordered menu) are part of the product element of the 7P marketing mix. Therefore, we defined the product as words that describe the customers' dining experience, including attributes like delicious food and menu variety.

Figure 4. Number of frequently occurring phrases based on each rating

In Figure 4a, out of a total of 1,807 repeated words across 33 phrases, we have only displayed phrases that appear more than ten times. The phrase "makanan enak" (delicious food), representing the product in the 7P marketing mix, appears 52 times. Summaries of Figures 4b through 4f are provided below.

For each ranking, there are distinct words that frequently appear in the reviews. In rank 5, out of a total of 490 phrases, the term "makanan enak" (delicious food), referring to the product, appears 40 times, followed by the phrase "terjangkau" (affordable), relating to the price, which appears 30 times. In rank 4, out of 126 phrases, the word "makanan enak" (delicious food), representing the product, appears 10 times, along with "terjangkau" (affordable), referring to the price, which also appears 10 times. Rank 3 includes the phrase "harga terjangkau" (affordable price), relating to the price, appearing 4 times. In rank 2, there are 6 phrases represented by the words "menu pesanan" (ordered menu), which appear twice, followed by "lumayan enak" (quite delicious), with the same frequency of appearance. Lastly, in the top rank, there are 29 phrases represented by the term "nasi goreng" (fried rice), denoting the product, and it appears 4 times.

Based on the coding of these phrases, it can be concluded that the marketing mix element most frequently mentioned by customers in their reviews is the product, occupying the first position among the 7P marketing mix elements.

Based on the data analysis presented in Figure 5, several important findings regarding the influence of the 7P marketing mix elements on customer reviews at Kebalen Cafe have emerged. The following conclusions and findings can be drawn.

All Rating

TERM	%	Elemen 7P	PHRASE	%
8	24,2%	PRODUCT	16	41,0%
2	6,1%	PROMOTION	3	7,7%
9	27,3%	PLACE	4	10,3%
7	21,2%	PRICE	13	33,3%
2	6,1%	PROCESS	1	2,6%
5	15,2%	PEOPLE	2	5,1%
0	0,0%	PHSYCAL EVIDENCE	0	0,0%
33	100,0%		39	100,0%

Rating 5

TERM	%	ELEMEN 7P	PHRASE	%
15	31,25%	PRODUCT	33	32,67%
4	8,33%	PROMOTION	7	6,93%
13	27,08%	PLACE	14	13,86%
8	16,67%	PRICE	36	35,64%
1	2,08%	PROCESS	1	0,99%
6	12,50%	PEOPLE	8	7,92%
1	2,08%	PHSYCAL EVIDENCE	2	1,98%
48	100,00%		101	100,00%

Rating 4

TERM	%	ELEMEN 7P	PHRASE	%
14	37,84%	PRODUCT	16	45,71%
3	8,11%	PROMOTION	3	8,57%
8	21,62%	PLACE	3	8,57%
7	18,92%	PRICE	12	34,29%
2	5,41%	PROCESS	0	0,00%
3	8,11%	PEOPLE	1	2,86%
0	0,00%	PHSYCAL EVIDENCE	0	0,00%
37	100,00%		35	100,00%

Rating 3

TERM	%	ELEMEN 7P	PHRASE	%
10	34,48%	PRODUCT	4	33,33%
0	0,00%	PROMOTION	0	0,00%
8	27,59%	PLACE	2	16,67%
5	17,24%	PRICE	5	41,67%
1	3,45%	PROCESS	0	0,00%
5	17,24%	PEOPLE	1	8,33%
0	0,00%	PHSYCAL EVIDENCE	0	0,00%
29	100,00%		12	100,00%

Rating 2

TERM	%	ELEMEN 7P	PHRASE	%
12	80,00%	PRODUCT	2	100,00%
0	0,00%	PROMOTION	0	0,00%
0	0,00%	PLACE	0	
1	6,67%	PRICE	0	
0	0,00%	PROCESS	0	
1	6,67%	PEOPLE	0	
1	6,67%	PHSYCAL EVIDENCE	0	
15	100,00%		2	

Rating 1

TERM	%	ELEMEN 7P	PHRASE	%
10	37,04%	PRODUCT	9	75,00%
1	3,70%	PROMOTION	0	0,00%
5	18,52%	PLACE	1	8,33%
2	7,41%	PRICE	2	16,67%
3	11,11%	PROCESS	0	0,00%
5	18,52%	PEOPLE	0	0,00%
1	3,70%	PHSYCAL EVIDENC	0	0,00%
27	100,00%		12	100,00%

Figure 5. Shows the percentage of each 7P marketing mix element based on each rating.

The product element garners the most attention from customers in their reviews, with occurrence percentages of 41% for the all rating category, 32.67% for rating 5, and 45.71% for rating 4. This underscores the significance of product quality as the primary influencing factor for customers when providing reviews.

The price element also holds importance in shaping customer reviews [20], with occurrence percentages of 34.29% for the all rating category, 35.64% for rating 5, and 34.29% for rating 4. This suggests that competitive and quality pricing are crucial considerations for customers when expressing their opinions [20].

The place and promotion elements exert influence on customer reviews as well [20], albeit with lower percentages compared to the product and price elements. This indicates that the location of the establishment and marketing strategies also play a noteworthy role in shaping customer reviews.

The process, people, and physical evidence elements, which constitute other components of the marketing mix, exhibit lower occurrence percentages in comparison to the other elements. This suggests that while these three elements remain important, they do not possess a significant impact on customer reviews.

Customers who assign a rating of 2 solely mention the product and promotion elements, while those awarding ratings of 3, 4, and 5 mention more than two marketing mix elements. This demonstrates that as the rating increases, customers perceive a greater number of marketing mix elements as crucial in their reviews.

Hence, the findings of this study affirm that the marketing mix elements indeed influence customer reviews, with the product and price elements emerging as the most significant factors. Consequently,

companies should prioritize product quality and appropriate pricing as strategic endeavors to enhance customer satisfaction and foster more positive reviews. Additionally, companies should also devote attention to the place and promotion elements, recognizing their significance in influencing customer reviews.

CONCLUSION

The initial findings of this study suggest that customers who use more words in their reviews and share more photos are more likely to express satisfaction with the restaurant's product or service. In this case, reviews with a higher number of photos are likely to indicate a positive experience for customers. However, due to the limited number of reviews in the dataset, these results may not be applicable to all customers. Therefore, further research is necessary to validate these findings.

Additional findings indicate that reviewers who contribute more tend to have more experience in providing reviews. The majority of reviewers write short reviews, averaging 1 to 10 words per review. Most reviewers submit between 0 and 20 reviews and use simple and easily understandable sentences. The photos uploaded by reviewers in their reviews assist other customers in comprehending the reviews and are well-received by fellow reviewers.

Based on text analysis using a word cloud, it can be concluded that the frequently mentioned words in the reviews include "delicious," "food," "cheap," and "price." These words have a high frequency of occurrence, particularly in ratings 3, 4, and 5. Additionally, the word "student" appears prominently in the word cloud and is often associated with the word "price" in Rating 3, indicating that many reviewers are students. In Ratings 2 and 1, reviewers tend to comment on the variety of menu options offered by the restaurant.

In the final part of our study, it was found that customers predominantly discuss the product and price elements in their reviews, while the place, promotion, process, people, and physical evidence elements have lower percentages. Furthermore, the marketing mix elements discussed by customers vary depending on the given rating. These findings offer valuable insights for companies to comprehend customer preferences and enhance their marketing strategies. Companies can emphasize the product and price aspects in their marketing efforts while considering other crucial elements in specific ratings. This study also highlights the significance of utilizing text analysis and data visualization techniques, such as word clouds, to comprehend customer preferences.

Nevertheless, this study has several limitations that should be acknowledged. Firstly, we only collected online review data from the Google Maps website for one restaurant, Kebalen Cafe, limiting the generalizability of our research findings. Future studies should aim to include more diverse data to provide broader insights applicable to the entire restaurant industry. Additionally, further research could encompass all online reviews to identify the most frequently mentioned 7P marketing mix attributes by reviewers and explore the contexts in which those words are used.

Secondly, we recognize that the method employed is not flawless, despite taking meticulous steps to minimize errors in our analysis with detailed descriptions of the process. To mitigate errors in conducting online text analysis, the definitions of the 7P elements were specifically tailored to real restaurant customer evaluations. We employed an unstructured text approach to analyze online review data, enabling researchers to automatically analyze large volumes of data typically available on the web. Therefore, future studies that employ multiple theoretical frameworks and diverse methodologies are likely to offer fresh insights into our understanding of complex phenomena. Consequently, we recommend the utilization of novel methodologies and different theories in future studies to further deepen our comprehension of such intricate phenomena.

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