

Text Mining: Sentiment Analysis of Reviews on TripAdvisor for Vietnam's Michelin-Starred and Selected Restaurants in the 2023 Michelin Guide

Ha Linh Nguyen¹, Thi Hai Dao^{1*}

Abstract

The proliferation of the Internet has led to a surge in online reviews, making social media platforms a crucial resource for consumers before making purchases. This study examines how the overall sentiment towards Vietnam's restaurants changes after they receive the recognition in the 2023 Michelin Guide, as well as which dimensions (food, service, ambiance and price) experience the greatest or least alterations after the award and which dimensions most influence the overall sentiment. The research involves a sentiment analysis of online reviews of Vietnam's restaurants honored by the 2023 Michelin Guide on TripAdvisor from 1 January to 31 December 2023. A total of 1,292 English and Vietnamese reviews from 4 Michelin-starred restaurants and 70 Michelin-selected restaurants located in Hanoi and Ho Chi Minh City were extracted using a web crawler named Apify. Data were then processed and analyzed by using data collection methods, text mining methods, and the Azure sentiment analysis tool in Excel. The research findings reveal that the overall sentiment declined after the Michelin recognition. Among the four dimensions, food was the most affected criterion, followed by service, ambiance, and price. Notably, the sentiment around ambiance was the highest and increased after the award. Overall sentiment towards Michelin-selected restaurants is higher than that of Michelin-starred restaurants. These insights provide valuable guidance for Michelin restaurant owners facing challenges in maintaining quality, meeting high customer expectations, managing their online reputation, and for diners intending to eat out to choose a suitable destination. This first research about Vietnamese Michelin restaurants using text mining and sentiment analysis methods identifies specific areas for improvement in food, service, ambiance, and price, and highlights the different impacts on Michelin-starred versus Michelin selected establishments, offering targeted recommendations to enhance services, attract more positive reviews, and improve overall performance and customer satisfaction.

Key Words: Michelin Guide in Vietnam, Online Restaurant Reviews, Sentiment Analysis, Text Mining.

I. INTRODUCTION

In many countries, eating out has become a common trend due to its convenience, social interaction and economic growth [1]. Today, in the world of technological growth, online reviews have become an undeniable force influencing consumer behavior, especially in the realm of fine dining. The Michelin Guide is a prestigious reference for potential customers, providing information on restaurant locations, cuisine types, and previous reviews. Interestingly, the year 2023 marked a significant milestone for Vietnamese cuisine with the debut of the Michelin Guide in Hanoi and Ho Chi Minh City, recognizing exceptional restaurants and introducing Vietnam to the global fine dining stage. Michelin awards based on stringent criteria such as quality, flavor, and consistency [2], serve as a sign for diners seeking an unforgettable culinary experience. One star

signifies high-quality cooking, two stars represent exceptional experiences, and three denotes truly extraordinary cuisine [3].

There are numerous prior studies about online restaurant reviews and Michelin-starred restaurants. Choi and Ok [4] investigates how online reviews influence diners' choices to dine out, emphasizing on the importance of information reliability and the credibility of the source in shaping customers' perceptions. Meanwhile, the study of Silva et al. [5] examines the influence of online reviews on consumers' intent to visit restaurants, considering the moderating effect of consumer involvement. The crucial of online ordering systems in the online reviews in the restaurant industry is highlighted in the study of Batra [6], while Abbie [7] discusses the advantages and disadvantages of online restaurant reviews as important as source of information and feedback meaning for restaurants. Additionally, Ninh and Uyen

Manuscript received April 24, 2024; Revised June 06, 2024; Accepted June 12, 2024. (ID No. JMIS-24M-04-013)

Corresponding Author (*): Thi Hai Dao, +84-966-593-199, haijulie02@gmail.com

¹International Communication and Culture, Diplomatic Academy of Vietnam, Hanoi, Vietnam, halinh2395@gmail.com, haijulie02@gmail.com

[8] examine the positive and direct impact of online review credibility on restaurant' image and indirectly promotes word-of-mouth intentions on social networks.

Regarding Michelin Guide, Rita et al. [9] conduct a sentiment analysis focusing on Michelin-starred restaurants, while Sahin et al. [10] explore customer perceptions driven by curiosity about these restaurants. Several studies also focus on Michelin Bib Gourmand, recognizing good quality and value cooking, and examining customer satisfaction levels [11]. Despite numerous studies on Michelin-starred and Bib Gourmand restaurants, research on Michelin-selected restaurants is limited.

In Vietnam, people tend to eat out more and rely on online reviews before making a purchase decision [8]. Therefore, to gain a deeper understanding of Vietnam's burgeoning fine dining scene, this study focuses on online reviews, specifically on TripAdvisor, a leading travel platform with a vast global user base. The research aims to analyze customer overall sentiment before and after the Michelin Guide's publication to understand how perceptions change in response to this prestigious recognition.

This study will examine three following research questions:

- (1) Does the 2023 Michelin Guide list of Vietnam' restaurants (including Michelin-starred and selected restaurants) affect customers' overall sentiment towards the restaurant?
- (2) Which dimensions (food, service, ambiance and price) experience the greatest or least alterations after the list was published?
- (3) Which dimensions impact the overall sentiment the most?

The remainder of this paper is organized as follows: Section 2 provides an overview of prior studies concerning text mining, sentiment analysis, online reviews, Michelin Guide restaurants and Vietnam's dining status; Sections 3 details the framework and hypothesis of the study; Section 4 describes the methodology used to analyze the data for this research; Session 5 highlights the key findings and related discussion; Section 6 shows the conclusion, limitations of the research and potential areas for future study.

II. LITERATURE REVIEW

2.1. Text Mining and Sentiment Analysis

2.1.1. Text Mining

Text mining is originally defined as the computer-based exploration of new, previously undiscovered data that involves the automatic extraction of information from various written sources [12]. Many later studies about text mining

have different definitions, however they still base on the original research such as Zhang et al. [13]; Dang and Ahmad [14]; Sathya and Rajendran [15]. This field of study has gained significant attention due to the proliferation of textual information on the Internet [13].

2.1.2. Sentiment Analysis

The term "sentiment analysis" perhaps first introduced in the study of Nasukawa and Yi (2003), while the term "opinion mining" initially mentioned in Dave et al.'s study (2003) (according to the study of Liu [16]). However, the first study about sentiment analysis was conducted by Stagner in 1940, focusing on public or expert opinion [17].

Today, sentiment analysis, also known as opinion mining, is defined as a crucial aspect of natural language processing that is used to determine how the general public feels about a certain issue or product [18]. It uses machine learning, natural language processing, data mining, and artificial intelligence techniques to mine, extract, and classify user opinions for a variety of attitudes towards businesses, individuals, services, events, or ideas. Sentiment analysis captures the polarity of the text, which can be then further classified according to its polarity as positive, negative or neutral.

In conclusion, text mining and sentiment analysis serve as vital tools for analyzing online reviews, helping organizations in extracting valuable insights from customer feedback, evaluating brand perception, and enhancing product attributes [19]. Additionally, utilizing sentiment analysis and text mining enhances service quality by assessing sentiment evaluations in online reviews [20].

2.2. Online Reviews

2.2.1. Online Reviews

In the past, people depended on word-of-mouth or personal recommendations and lengthy research to guide their purchasing decisions or select services, making the decision-making journey much slower [26]. Today, with the advent of the Internet, when buying products, purchasers often consider online comments. In other words, they turn to electronic word of mouth (eWOM) [22]. Online reviews is a form of eWOM in which reviewers both feed user-generated content and spread reviews [23]. Studies show that 95 % of customers read product reviews before purchasing, and 49% trust online reviews as much as personal recommendations [24]. Consequently, online reviews have impacted positively and directly on the business's image and brand, and indirectly promoted customers' intention to spread word-of-mouth on social networking sites [8].

2.2.2. Restaurant Reviews

Online reviews play a pivotal role in how consumers perceive and behave towards restaurants. Sentiment analysis

classifies reviews into positive, negative or neutral sentiments, aiding in understanding customer attitudes towards food, service, ambiance, and other aspects [25]. Therefore, it is important for providers to have continuous improvement and innovation based on feedback from online comments about flavor of dish, service quality, atmosphere, and waiting times when dining out.

2.2.3. *TripAdvisor*

Online restaurant reviews on TripAdvisor have become a crucial element influencing consumer decision-making. TripAdvisor is more likely to influence a diner's restaurant selection compared to other online channels. TripAdvisor is a reliable source for restaurant suggestions, with more than 78% of US respondents preferring it over Yelp, Google, and Facebook when selecting a restaurant locally [26]. It is interesting to note that, being founded in 2000, TripAdvisor hosts over 988 million reviews and opinions from around 8 million businesses, including restaurants [27].

2.3. Michelin Guide

2.3.1. *Michelin Guide*

The Michelin Guide, or Red Guide, is a collection of guidebooks published by the French tire company Michelin since 1900. Founded in 1889 by brothers Andre and Edouard Michelin, the Michelin maps began as a marketing tool for Michelin tires, offering complementary information to motorists about where to find good accommodations and good food [28].

The Michelin Guide has several categories of recognition, including Michelin-starred restaurants, Michelin-selected restaurants, and Bib Gourmand. Specifically, Michelin stars are awarded to restaurants that excel in cooking, meeting five universal criteria: top-notch ingredients, perfectly balanced and delightful flavors, exceptional culinary skills of the chef, unique creativity and style of the chef's food, and consistency across the entire menu and over time. One star signifies a very good restaurant within its category, two stars indicate excellent cuisine worth a detour, and three stars highlight exceptional cuisine deserving of a special journey [29].

Michelin-selected restaurants offer a high-quality dining experience but do not meet the criteria for a Michelin star. Bib Gourmand restaurants provide great food at reasonable prices, with the total cost for three courses coming under a certain amount, depending on the local cost of living [30].

2.3.2. *Consumer Dining Experience in Michelin-Starred Restaurants*

There are many reasons why consumers dine out in restaurants, including socioeconomic and cultural changes. These factors include increasing well-being, changing living conditions, the pursuit of enjoyment, and a curiosity for

diverse culinary experiences, gathering and having a good time with family and friends [31].

Michelin-starred restaurants are globally recognized for culinary excellence, and these establishments often experience a significant increase in customers after being awarded a star [32]. Generally, there are four aspects of a dining experience: customer attention, food quality, decor, ambiance, and price or value for money [33]. Consumers are particularly drawn to Michelin restaurants due to their curiosity and the unique experiences these establishments offer, especially regarding food and service aspects. Humanic clues such as staff appearance and interactions with customers play a pivotal role in shaping first impressions and can foster diners' satisfaction and loyalty [34].

2.4. Vietnam's Dining Status

In the past, Vietnamese dining culture primarily involved home-cooked meals and family gatherings. However, in recent years, dining out has become increasingly popular due to socioeconomic changes, urbanization, and the influence of global culinary trends. The launch of the Michelin Guide in Vietnam in 2023 has further elevated the country's culinary status, attracting both locals and tourists to explore the fine dining scene.

On June 6, 2023, in Hanoi, it was the first time for the Michelin Guide to honor 103 Vietnam's restaurants and 3 individuals in 4 categories: Michelin stars, Michelin selected, Bib Gourmand and Michelin Guide Special Awards. Two largest cities in Vietnam (Hanoi and Ho Chi Minh city) were chosen by Michelin to introduce Vietnam's best dishes to tourists and diners of all price ranges. In particular, this list includes 4 Michelin one-starred restaurants (3 in Hanoi and 1 in Ho Chi Minh City); 29 dining establishments received the Bib Gourmand award (13 in Hanoi and 16 in Ho Chi Minh City); 70 Michelin-selected restaurants (32 in Hanoi and 38 in Ho Chi Minh City) [35].

After the award, the keywords of names of Michelin-honored restaurants immediately became search content with a breakthrough increase in search results in Vietnam according to Google Trends rankings. Restaurant representatives claimed that there is a significant increase in the number of customers and diners must make reservations in advance and wait their turn in these restaurants. It highlights the big influence of the Michelin Guide to Vietnamese food lovers [36].

III. CONCEPTUAL FRAMEWORK AND RESEARCH HYPOTHESES

3.1. Conceptual Framework

Fig. 1 depicts the relationship between the dependent and

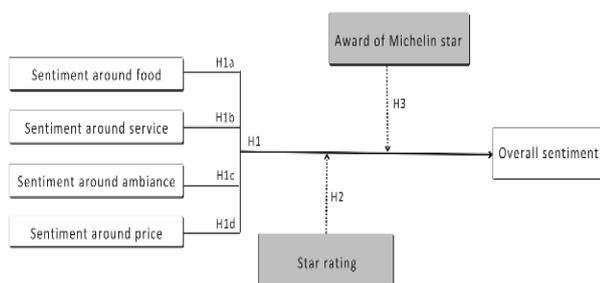


Fig. 1. Conceptual model-effect of the dependent and control (gray) variables on the overall sentiment.

control variables. In detail, four dimensions including food, service, ambiance and price are grouped as dependent variables based on the study of Zhong and Moon (2020) [37]. In that study, four criteria are dependent variables because they are fundamental items to make up consumers' dining experiences and affect the level of satisfaction. Accordingly, the author is able to find the results for the research question that determines which sentiments influence the overall sentiment the most.

On the other hand, star rating and award of Michelin star are considered control variables based on the results from Shin (2018) [38], Rita (2020) [9] and Bang (2022) [39]. By including these control variables in the analysis, the researcher can isolate the specific effects of Michelin stars and better understand their influence on restaurant operations and customer perceptions.

To be more specific, the study of Chiang and Guo (2021) [40] showed that the award of Michelin Guide has positive impact on overall sentiment towards Michelin Guide and has negative impact on overall sentiment towards Michelin-starred restaurants. In addition, Rita (2023) [32] found out that higher star ratings are associated with more positive sentiments towards the restaurant. As a result, these two control variables are extremely crucial. The Michelin award allows the author to have the exact date of the Michelin-honored list published day. As a result, this study can find how consumer overall sentiment changes before and after the award. Meanwhile, the star rating variable is controllable to understand whether assigned star ratings in reviews correlate with the overall sentiment expressed.

Besides, the study of Rita (2020) [9] indicated that in restaurant contexts, control variables also include two other groups which are the number of Michelin stars (one, two or three stars) and local language. However, this study focuses on Vietnam's restaurant and the 2023 Michelin Guide list in Vietnam, hence, these two variables (the number of Michelin stars and local language) are excluded because they are not appropriate with Vietnamese context. In fact, this is the first time Vietnam's restaurants are honored in the 2023 Michelin Guide list with one star being the highest award, hence, there is no data about the difference between the first,

second and the third star of the restaurant. Meanwhile, the local language is not suitable since the author collects data with English and Vietnamese reviews.

Finally, the main variable is overall sentiment, which highly depends on different variables to get the final result for this research.

3.2. Research Hypotheses

Prior reviews influence future customers' decisions. According to Lohuizen et al. [41], consumers are influenced by previous reviews, especially to the value of reviews, the platform on which they are posted and their perceived credibility. This means that there is an online influence in the process of text reviews, hence, before dining out, diners tend to visit restaurants' online platforms to read reviews. Accordingly, prestigious awards such as Michelin Guide can positively influence the overall sentiment of customers towards a restaurant. Therefore:

H1: Overall sentiment towards a restaurant increases after the Michelin award.

According to Ramakrishnan et al. [42], food stands out as the most significant factor shaping customer satisfaction. As a result, when a restaurant achieves a star or is listed in the Michelin Guide, food is the most affected dimension. Thus:

H1a: Food experiences the greatest impact, significantly influencing overall customer satisfaction.

In addition, ensuring high service quality is important as it directly affects customer satisfaction and restaurant prosperity, hence, it is essential to meet or exceed customer expectations [43]. Therefore:

H1b: Service experiences the second greatest impact, affecting customer satisfaction and restaurant prosperity.

The physical environment, including ambiance or atmosphere, restaurant layout, design, odor may contribute to overall dining experiences [44], however, in fine-dining settings, ambiance is the dimension that exhibits a weaker correlation with the overall satisfaction of customers at Michelin-starred restaurants. Consequently:

H1c: Ambiance is the least affected criterion due to its weaker connection to consumer satisfaction.

Consumers consider Michelin-starred restaurants as prestigious and luxurious establishments that provide luxurious and unique qualities. Therefore, customers are in-

clined to pay more money for the experience offered by these restaurants [45]. They do not complain about price before and after the award, hence, the author propose that:

H1d: Sentiment around price is not affected by Michelin recognition.

Star rating of a restaurant is a universal ranking, often on a 5-point scale. Hence, higher star ratings can positively influence the restaurant's ability to attract more customers and increase revenue [46]. Therefore, with the prestigious Michelin award, reviews about star rating are extremely important. Hence:

H2: Overall sentiment towards a restaurant correlates with star ratings.

The prestigious Michelin award is a highly recognized award upon restaurants that meet exceptionally high standards of cooking and service [47]. After receiving the first star or being selected in Michelin Guide, consumers' overall sentiment will change a lot. Therefore:

H3: Overall sentiment towards Michelin-starred restaurants is higher than Michelin-selected restaurants.

IV. METHODOLOGY

4.1. Data Collections Method

Data collection method encompasses various techniques utilized to gather and analyze valuable information. To be more specific, raw data analyzed in the study were sourced from TripAdvisor (<http://tripadvisor.com>). Then, they were extracted by a web crawler named Apify (<http://apify.com>) [48], which is a platform utilized by developers to create, deploy, and share web scraping, web automation tools and data extraction.

For each restaurant, the extracted information included the restaurant name, reviewer name, review title, written review, star rating, and visit date. The properties of the dataset are outlined in the following Table 1.

The list of Michelin-starred and selected restaurants was collected from the Michelin Guide website (guide.michelin.com) (Appendix). The research time ranges from 1 January 2023 to 31 December 2023.

On Tuesday, 6 June 2023, the Michelin Guide finally presented its first-ever selection of restaurants in Vietnam (Hanoi and Ho Chi Minh City). Therefore, the author divides the research time into two periods: One before the Michelin award (1 January-6 June 2023) and the other after the award (7 June-31 December 2023). In other words, reviews are collected six months before and after the Mich-

Table 1. Dataset properties description.

SN	Property	Description
1	Restaurant name	The name of 74 restaurants in the Vietnam 2023 Michelin Guide (4 one-starred Michelin restaurants and 70 Michelin-selected restaurants)
2	Restauran location	The location of the restaurants
3	Michelin stars	Type of restaurants with Michelin recognition (one Michelin star or Michelin selected restaurant)
4	Reviewer's name	The name of reviewers
5	Review title	The title of review
6	Written review	The text of review
7	Star rating	Stars ranging from 1 to 5
8	Review date	The date of published review
9	Language review type	Reviews collected are in English and Vietnamese

elin award.

The requirements for restaurants to be eligible for inclusion in the study are as follows:

- (1) Restaurants must have accumulated more than 4 reviews during the research period;
- (2) Restaurants with a significant disparity in the number of reviews before and after receiving the award will be excluded. Specifically, any restaurant where one period represents 80% or more of the total number of reviews will not be considered;
- (3) Restaurants that are included in the Michelin Guide but do not appear on TripAdvisor will be excluded.

Consequently, this research collects 1,292 English and Vietnamese reviews from 38 eligible restaurants (3 Michelin-starred and 35 Michelin-selected restaurants). Simultaneously, the other 36 ineligible restaurants with less than 4 reviews in the observed period or having a significant difference in the number of reviews before and after receiving the award are excluded. Accordingly, total reviews consist of 178 Vietnamese reviews, which accounts for 14% of total reviews, while there are 1,114 English reviews, making up the other 86% of total reviews. It is crucial to note that all Vietnamese reviews are translated into English for conducting sentiment analysis.

4.2. Sentiment Analysis Method

After that, 1,292 reviews in total were placed in Excel. This step is called import and clean data, in which the data

is cleaned by removing duplicates, irrelevant information, and formatting inconsistencies using several Excel functions such as Remove Duplicates, Filter, and Format Cells. Specifically, calculating sentiment scores based on the counts of positive and negative keywords to analyze overall sentiment trends in the data (<http://akkio.com>) [49].

Then, the author uses Azure sentiment analysis in Excel to analyze different types of sentiment in the reviews. To be more specific, this tool offers sentiment output and score for each review. Sentiment analysis has a scale from 0 to 1 [50]. A score around 0.5 is considered neutral, implying that the text expresses neither positive nor negative sentiment strongly. Scores closer to 1 suggest a more positive sentiment, while scores approaching 0 indicate a more negative sentiment (Table 2).

Subsequently, the author collects the results, analyze them to see how online reviews before and after the Michelin Guide list changed, whether more negative or more positive. This helps the researcher to answer the (1) research question: Does the 2023 Michelin Guide list of Vietnam’s restaurants (including Michelin-starred and selected restaurants) affect customers’ overall sentiment towards the restaurant?

4.3. Text Mining Method

With the list of reviews that are positive, negative or neutral, the author extracts nouns from the regular expressions list. After that, the author makes a list of all nouns from total reviews. These nouns then are grouped into 4 dimensions: service, food, ambiance, and price. Then, the author counts words to find the most frequently mentioned words. These steps allow the author to know the sentiment around the four main dimensions, hence, the author can answer the (2) research question: Which dimensions (food, service, ambiance and price) experience the greatest or least alterations after the list was published?

Then, to answer the (3) research question: Which dimensions impact the overall sentiment the most? The author continues to analyze words in different types (including food, service, price, and ambiance) in context to gain a comprehensive understanding.

In this text mining process, to extract the nouns, all words were normalized, all letters were changed into lowercase and all numbers and symbols were removed. As a result, the author is able to create a dictionary of words in four categories (food, service, price and ambiance), in which related

words turn into nouns. For example, “ambient vibe” and “atmosphere” turned into “ambiance”; “food”, “beverage”, “salad” and other related name of cuisines (Bun Cha, noodle, pizza, etc.) turned in to “food”; “staff”, “waitress” turned into “service”; “value”, “cost” turned into “price”. Vietnamese reviews are translated into English to be grouped in the list. The dictionary of such words is in the Table 3.

Table 3. Dictionary of words grouped into four dimensions.

Food	Service	Price	Ambiance
Beef	Assistant	Cheapness	Air
Burger	Bartender	Cost	Air-condition
Champagne	Chef	Expensive place	Ambient vibe
Courses	Chopsticks	Expensiveness	Atmosphere
Dessert	Exterior	Overpricing	Background
Dishes	Interior	Style	Cleanliness
Drinks	Manager	Value	Concept
Flavors	Ordering	-	Creativity
Ingredients	Patron	-	Crowd
Menu options	Payments	-	Decorated display
Pizza	Portion	-	Decoration
Pork	Professionalism	-	Garbage
Quality	Replacement	-	Garden
Rice	Server	-	Greetings
Salads	Serving size	-	Hygiene
Seafood	Speed of service	-	Lake
Set menu	Staff	-	Lighting
Snail	Staff device	-	Luxury
Soup	Staff knowledge	-	Neatness
Spaghetti	Wait staff	-	Organisation
Srab	Waiter	-	Plating
Staff attitude	Waitress	-	Presentation
Taste	-	-	Setting
Tasting menu	-	-	Toilets
Vegetable	-	-	Ventilation
Wine	-	-	View
Other cuisines name	-	-	WC

Table 2. Sentiment score calculation.

Positive	If sentiment score	>0.05
Negative	If sentiment score	<-0.05
Neutral	Otherwise	

V. RESULTS AND DISCUSSION

5.1. Overall Sentiment

5.1.1. Overall Sentiment in Terms of Written Reviews

The overall sentiment in all written reviews decreased after the award (Fig. 2).

From a total of 1,292 reviews, there are 527 reviews before and 765 reviews after the Michelin award. The average sentiment score before the Michelin award was 0.71, which decreased to 0.59 after the award.

In addition, the percentage of reviews per sentiment recorded a remarkable increase in the negative sentiment (Fig. 3).

In detail, a climb of nearly 2% was witnessed in the percentage of negative reviews while the proportion of positive reviews remained relatively stable at 72%. Adversely, the figure for neutral sentiment fell significantly by nearly 2% after the award. This may explain why the overall sentiment experienced a decrease after the Michelin award.

5.1.2. Overall Sentiment in Terms of Star Rating

Overall, the average sentiment increases as the star rating increases, except in three-star ratings (Table 4).

It is interesting to note that over 1,292 total reviews, there are 1,004 reviews with 5 star rating, followed by 135 reviews with 4 stars and this figure continues to decrease in smaller stars, with 39 one-star-rating reviews. Notably, the sentiment aligns with star rating as the average sentiment of reviews with 1, 2, 3 stars are negative, reviews with 4 stars are close to neutral and 5-star rating reviews are positive as expected (Fig. 4).

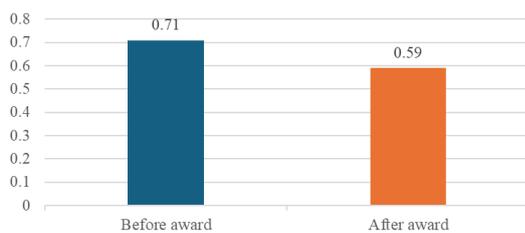


Fig. 2. Changing in average sentiment before and after the Michelin award.

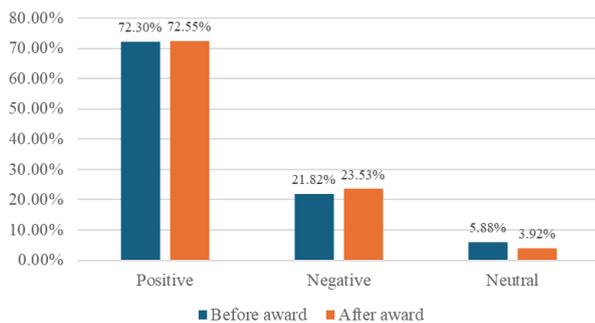


Fig. 3. Reviews per sentiment before and after the Michelin award.

Table 4. Average sentiment of reviews' star rating.

Star rating	Reviews	% of total	Average sentiment
1	39	3.00	0.06
2	40	3.10	0.23
3	74	5.70	0.19
4	135	10.50	0.57
5	1,004	77.70	0.79
Total	1,292	100.00	-

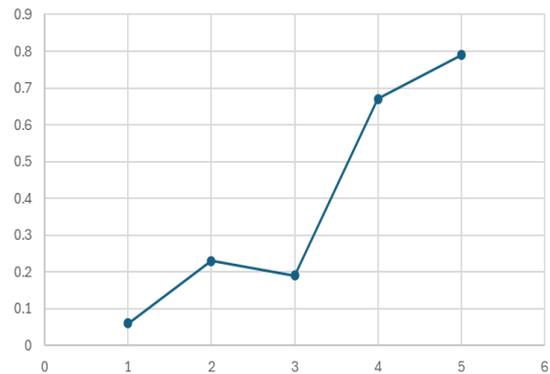


Fig. 4. Average sentiment vs star rating relationship.

5.1.3. Overall Sentiment towards Michelin-Starred and Selected Restaurants

Regarding overall sentiment towards two different types of restaurant, which are Michelin-starred and Michelin-selected restaurants, Table 5 depicts that average sentiment towards Michelin-selected restaurants is much higher than the figure for Michelin-starred restaurants. In detail, the overall sentiment of Michelin-selected restaurants is 0.73, 0.26 higher than that of Michelin-starred restaurants.

5.2. Specific Dimensions

After finding nouns from 1,292 total reviews and grouping them into four different categories namely food, service, price and ambiance (More information can be found in Table 3), the author can answer the (2) research question.

5.2.1. Dimensions Changing after the Award

Regarding Table 6, food is the most affected among four dimensions while the adverse pattern is price.

It can be observed that food is the most mentioned category with 1,068/1,292 reviews, accounting for 43% before

Table 5. Average sentiment towards Michelin-starred and selected restaurants.

	Before	After	Overall sentiment
Michelin-starred	0.52	0.42	0.47
Michelin-selected	0.73	0.72	0.73

Table 6. Average sentiment per dimension.

Dimension	Time of review	Number of Sentiments	% of subtotal	Average sentiment	% of total
Food	Before	466	43.6	0.72	43
	After	602	56.4	0.7	
	Total	1,068	-	0.71	
Service	Before	382	43.8	0.74	35
	After	491	56.2	0.72	
	Total	873	-	0.73	
Price	Before	64	43.2	0.6	6
	After	84	56.8	0.52	
	Total	148	-	0.56	
Ambiance	Before	201	50.5	0.76	16
	After	197	49.5	0.78	
	Total	398	-	0.77	
Total	Before	1,113	44.8	0.71	100
	After	1,374	55.2	0.68	
	Total	2,487	-	0.7	

and after the award. Following this, service is the second mentioned group in customers' reviews with 873 reviews in total with 35%, preceded by ambiance with 398 reviews with 16%. Price ranks last with 148/1,292 reviews mentioning this category, taking up only 6%.

5.2.2. Sentiment Changing in four Dimensions

Table 6 also finds out that the average sentiment in four dimensions decreases after the award, except for that of ambiance, which witnesses a notable growth in its average sentiment. This finding explains the decrease in reviewers' overall sentiment mentioned before. In detail, the average sentiment in the ambiance group is the highest with 0.77 in total, which increases from 0.76 to 0.78 after the award. Meanwhile, the average sentiment of service ranks second with 0.73 in total, which decreases from 0.74 to 0.72 during the observed period. Following this, food's average sentiment also falls by 0.2 to 0.70 after the award. Interestingly, price has the lowest average sentiment with 0.56 in total, which also dips from 0.6 to 0.52 after the award.

Table 7 provides information about the dimensions that affect the overall sentiment, which food has the most impact on overall sentiment.

Table 7. Dimensions influence on sentiment (%).

	Food	Service	Price	Ambiance
Positive	42.25	35.87	4.43	17.45
Negative	45	32.02	10.92	12.10
Neutral	44.76	37.14	7.62	10.50

To exemplify, the dimension that affects overall sentiment the most is food, followed by service, ambiance and price, respectively in all negative, positive and neutral sentiment. To answer why and how these sentiments affect the overall sentiment, the researcher analyzes words from individuals' written reviews to collect the groups of words according to positive, negative and neutral sentiment.

5.2.3. Positive Sentiment Per Dimensions

In 1,292 reviews in total, there are 936 positive reviews, in which 42.25% of them review about food, followed by 35.87% and 17.45% that of service and ambiance in turn, and only 4.43% present their sentiment towards price:

Example (1):

"... *Five out of five for ambiance, service, menu and food. If you are a foodie this place is heaven. There are way too many highlights to choose a favorite dish... Everything we ate was a flavor explosion... Portions are very generous... The mashed/ creamed potatoes are so decadent...*" (TripAdvisor, 2023)

The reviewer evaluates the restaurant across multiple dimensions, including ambiance, service, menu, and food quality. They give a perfect score of "five out of five" for each of these aspects, indicating an exceptional experience across the board. First of all, this positive review uses some words to describe food such as "generous", "decadent", "heaven", adding with adverbs such as "very", "so", which increases the positive sentiment in the review. Interestingly, the word "explosion" has a negative meaning in general, however in restaurant areas and in this context, the reviewer uses the phrase "flavor explosion" to describe the exceptional taste and quality of the dishes.

Example (2):

"*Cảnh đẹp, không gian ấm cúng, đồ ăn ngon. Có thể giới thiệu người thân đến ăn.*" (Beautiful view, cozy environment, good food. I can recommend this place to my relatives.) (TripAdvisor, 2023)

This review uses the verb "recommend", indicating a strong endorsement of the restaurant and meaning that the reviewer had a positive experience significant enough to prompt them to recommend it to their relatives.

To sum up, some positive words such as "tasty", "generously", "soft" are classified into food categories. Furthermore, "helpful staff", "knowledgeable waitress", "quick service" are sorted into service groups. For price, some positive words are "reasonable", "value for money", "cost-effective"; and finally, "nice atmosphere", "clean", "food hygiene", "good mood", "warmth" are grouped into ambiance items.

5.2.4. Negative Sentiment Per Dimensions

Regarding Table 6, there are 295 negative reviews overall, particularly, 45% of them mentions food, followed by service (32.02%), ambiance (12.10%) and price (10.92%). Noticeably, the figure for price in negative sentiment is highest among three sentiments. In addition, in terms of Table 6, the average sentiment per price witnessed a deepest decrease among four dimensions after the award:

Example (3):

"I really have to say the food is bad, overall is bad. The service is not really up to standard as a Michelin one star restaurant, and the floor is not clean and the toilet is not clean." (TripAdvisor, 2023)

In this negative review, the reviewer uses negative words to describe the experience such as "bad", "not really", "not". Overall, the customer considers food, service and ambiance of the restaurant as bad.

Example (4):

"Not worth the hype. Long wait and over priced. Would not recommend Anan." (TripAdvisor, 2023)

In the beginning of the text, the phrase "not worth the hype" suggests that the restaurant does not live up to its reputation. The reviewer also complains about two aspects, which are the wait time ("long wait") and the pricing ("over priced"). Notably, the phrase "would not recommend" indicates a strong negative sentiment towards the restaurant.

Example (5):

"First of all; the cleanliness of the restaurant was absolutely awful. Sauce and pieces of salad were found on the floor where I was seating; the toilet on the 2nd floor was pretty disgusting. Service wise; the waitress there was definitely not up to Michelin star standard... their bad English." (TripAdvisor, 2023)

Negative words are used in this review such as "awful", "disgusting", "not up to" when commenting about the service and ambiance. The reviewer starts by highlighting significant cleanliness issues within the restaurant. They mention finding sauce and pieces of salad on the floor where they were seated, and describe the toilet as "pretty disgusting", suggesting a lack of cleanliness in the restroom facilities, which is an important aspect of a dining establishment's overall hygiene and customer experience. Furthermore, the service did not meet the expected level of excellence associated with such prestigious recognition because the staff are not good at English.

In conclusion, in negative sentiment, in terms of food,

some negative words represent the menu such as "food size", "rough texture", "pre-made". Regarding service, some negative words are "staff knowledge in English", "slow service", "poor service", "unkind", "facial expression". Some words such as "over priced", "expensive", "costly" are classified into the price section. Meanwhile, negative words in the ambiance group are "dirty", "loud", "mold".

5.2.5. Neutral Sentiment Per Dimensions

There are 61/1,292 neutral reviews, in which the most mentioned item is food (44.76%), food (37.14%), ambiance (10.50%) and price (7.62%) respectively. In neutral sentiment, the reviewers tend to give two different opinions and do not specify which one is better:

Example (6):

"The food is exceptionally good, very good ingredients, incredibly fresh and very tasty. The steak was particularly good. Service was very friendly but was very clunky." (TripAdvisor, 2023)

In this text review, the reviewer begins by expressing positive sentiments about the food quality, however, they also mention that it was "very clunky". The word "but" used to connect these two statements indicates a contrast between the positive aspect of friendliness and the negative aspect of clumsiness or inefficiency in service delivery. Hence, this is considered to be a balanced feedback.

Example (7):

"The place is just a 5 min walk from Saigon Center shopping mall.... We had 5 different cocktails among ourselves and we're satisfied. Try the Godfather, it's not very interesting... But for the tacos, as a meat eater, I bet it will be much better with meat. Dessert was mochi, not disappointing but average ..." (TripAdvisor, 2023)

The reviewer provides neutral information about the restaurant's location at the start of the review. The reviewer employs words and phrases such as "not very", "much better with", "not disappointing but average", and linking words like "but" and "however" to convey a sense of uncertainty or neutrality in their opinions. These words and phrases suggest that the reviewer's feelings about the food are not strongly positive or negative, but rather nuanced and open to interpretation.

In summary, neutral sentiment includes words with uncertain meanings such as "not very", "much better with", "average", especially the linking words with negative sentiment such as "but", "however", "adversely" to connect two connect two clauses with two separate views about the

same category.

5.3. Discussion

This research bases other research results of Ramakrishnan et al (2016) [53]; Pacheco (2018) [64]; Chua et al., (2020) [52]; Rita et al. (2021) [9]; Lopez [53] and Zhou (2024) [29]. In particular, H1 is rejected due to some following reasons. Fig. 2 illustrates that the overall sentiment decreased after the award. The growth in negative sentiment after the Michelin awards explains that consumers have higher expectations for Michelin-honored restaurants, and they tend to have negative sentiments if their expectations are not met. This finding agrees with the result of the research conducted by Rita et al. (2022) [9], which overall sentiment decreased following the award of a Michelin Star to a restaurant. Additionally, there is a relative stability in the positive and neutral sentiment, in addition with the increase in negative reviews, contributing to the decrease in overall sentiment. This is because consumers tend to focus more on products or services that have excellent reviews, meaning this result is consistent with the results of this study.

In detail, H1a is validated while H1b, H1c, H1d are rejected. Table 6 elucidates the average sentiment per each dimension, which food recorded the most affected with 43% reviews, followed by service, ambiance and price, which validates H1a and agrees with Ramakrishnan et al. (2016) [42] with finding that food is extremely important as it shapes customer satisfaction. This indicates that consumers tend to have higher expectations for high-end dining venues, particularly Michelin-starred or selected establishments, leading to disappointment when food quality is not fulfilled [9].

On the other hand, service is important, however, it is not the most affected aspect, leading to H1b being invalidated. Although H1b is not correct, the findings agree with the result that food and service groups have a greater correlation with overall consumer satisfaction than other criterias (Pacheco, 2018) [51].

Regarding Table 6 and Table 7, ambiance is not the least affected item in restaurant review after the award, which rejects H1c. The finding is that ambiance ranks third in the most affected item with 16%, 10% higher than price, which ranks last among four categories. It is interesting to note that the overall sentiment around ambiance is the highest with 0.77, climbing from 0.76 to 0.78 after the award (Table 6). This means that the ambiance or interior design, and atmosphere of a restaurant hold significant sway over consumer preferences and their dining satisfaction. Accordingly, great ambiance attracts positive sentiment from customers and creates a relaxed, romantic, energetic, or casual atmosphere which sets the mood for the dining experience. For example, comfortable seating and a well-arranged

table can ensure the enjoyment of customers about the meals without any physical discomfort [53].

Table 6 also depicts that price is the least affected item after the award, meaning that H1d is rejected. Price witnessed an overall decrease in sentiment towards a restaurant after the award, from 0.6 to 0.52 with 6% reviews in total. However, the price group recorded the least affected after the award because consumers were more influenced by food, restaurant ambiance and service than they were by the price of the dish, particularly in well-known restaurants such as Michelin-honored ones [52]. This can be explained by the report from Mibrand Vietnam, which five factors affect Vietnamese consumers the most are food, followed by price, ambiance, staff attitude and service process [54]. This study focuses on Vietnam's restaurant, hence, the findings are appropriate with Vietnamese dining habits.

In terms of star rating, Table 4 gives information that the average sentiment towards a restaurant increases as the star rating increases, which validates H2. It means that one-star rating signifies the most negative sentiment while a five-star rating represents the most positive sentiment. It explains the natural feelings of customers when they feel bad about the restaurant, they mark it with the lowest star and vice versa. This result also appeared in the research of Pacheco (2018) [64] which finds out the consistency between star ratings and sentiments expressed in online reviews.

Regarding overall sentiment towards Michelin-starred and selected restaurants, Table 7 illustrates that that of the Michelin-selected group is much higher than Michelin-starred, hence, H3 is rejected. In fact, there are 527 reviews before and 765 reviews after the Michelin award, meaning that diners tend to review more after the restaurant was honored in Michelin Guide as a sign for later comers whether it is a good or bad place. However, this finding explains that a higher number of reviews does not mean higher positive sentiment toward Michelin restaurants. This may be because after the award, starred restaurants tend to offer personal, truly unique or innovative food to be appropriate with Michelin star, hence, it disrupts the Michelin rating system [54].

VI. CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

In conclusion, this research has explored the complex dynamics of Michelin Guide restaurants in Hanoi and Ho Chi Minh City in Vietnam, revealing a notable decline in overall sentiment following the award. This study is pioneering in Vietnam, using text mining and sentiment analysis to gauge customer sentiment through online reviews of Vietnamese Michelin restaurants.

Unlike previous studies, this research specifically examines the Michelin Guide's impact in Vietnam, making way for further exploration of Vietnamese dining habits. It was found that the overall sentiment decreased post-award and food being the most affected criterion, followed by service, ambiance, and price. This highlights the higher expectation of customers about Michelin Guide destinations. Notably, while ambiance was neither the most nor least affected dimension, it had the highest overall sentiment and showed improvement post-award, suggesting it has a substantial impact on customer satisfaction. This implies that even after receiving a prestigious Michelin award, restaurants must continue to innovate, protect their core strengths, and adapt their strategies to meet emerging challenges in a competitive and evolving gastronomic landscape.

However, this study has several limitations. Firstly, the scope is limited. This research focuses on specific aspects, particularly the customer sentiment post-award, which may not fully capture the Michelin recognition's broader impact on Vietnam's food industry. Secondly, data collection was limited. This study collects English and Vietnamese reviews from four one-Michelin-starred restaurants and 70 Michelin-selected restaurants. However, after filtering to find out the suitable reviews, only 51% of total restaurants had the eligible reviews, potentially missing a broader range of practices and experiences. Lastly, the lack of comparison with other restaurant awards limits a comprehensive understanding of these awards' roles in the food industry.

Moving forward, further research should delve deeper into evolving trends and perceptions surrounding Michelin Guide establishments, offering valuable insights for practitioners, policymakers, and scholars in navigating the ever-evolving realm of high-class cuisine. Future studies should be conducted with other methods besides sentiment analysis to find out the answer for some remaining questionable results, especially about consumer's behavior. In addition, future analysis can focus on various types of restaurant awards in Michelin Guide such as Michelin-starred, selected and Bib Gourmand restaurants to collect numerous data to gather extensive data for more accurate results. Furthermore, innovative studies should explore the role of creativity and innovation in Michelin Guide restaurants, their impact on the dining experience, and the effects of globalization and localization on these establishments.

REFERENCES

- [1] J. S. A. Edwards, "The food service industry: Eating out is more than just a meal," *Food Quality and Preference*, vol. 27, no. 2, pp. 223-229, 2013.
- [2] V. L. Limina, "The Effect of the Michelin guide on attracting tourists," *Journal Hospitality dan Manajemen Jasa*, vol. 7, no. 2, 2019.
- [3] FAQ, MICHELIN Guide, <https://guide.michelin.com/en/faq-frequently-asked-questions>
- [4] J. W. Choi and C. Ok, "The effect of online restaurant reviews on diners' visit intention: A comparative analysis of expert vs. peer reviews," *ScholarWorks @ UMass Amherst*, 2011.
- [5] L. A. Silva, X. Leung, and E. E. Spers, "The effect of online reviews on restaurant visit intentions: Applying signaling and involvement theories," *Journal of Hospitality and Tourism Technology*, vol. 12, no. 4, pp. 672-688, 2021.
- [6] Restolabs, Online Reviews in Restaurant Industry, <https://www.restolabs.com/blog/online-reviews-restaurant-industry>
- [7] Abbie, Pros and Cons of Online Restaurant Reviews. <https://www.carbonaraapp.com/pros-and-cons-of-online-restaurant-reviews/>, 2024.
- [8] N. H. Ninh and P. T. Uyen, "Nghiên cứu sự tin cậy của đánh giá trực tuyến trên mạng xã hội," *Tạp chí Kinh tế & Phát triển*, 2021.
- [9] P. M. R. F. Rita, "Tripadvisor reviews on Michelin-starred restaurants: A sentiment analysis," *MGI*, 2020.
- [10] A. Sahin, U. Colakoglu, and O. N. Ozdogan, "A research on customer experiences and perceptions for Michelin starred restaurants," *Journal of Multidisciplinary Academic Tourism*, vol. 6, no. 1, pp. 61-72, 2021.
- [11] H. W. Do, "A study on importance and satisfaction of Michelin restaurant selection attributes-Starred restaurants and Bib Gourmand restaurants," *Journal of the Korean Society of Food Culture*, vol. 35, no. 1, pp. 55-64, 2020.
- [12] M. Hearst, What Is Text Mining? <https://www.jaist.ac.jp/~bao/MOT-Ishikawa/FurtherReadingNo1.pdf>, 2003.
- [13] Y. Zhang, M. Chen, and L. Liu, "A review on text mining," in *2015 6th IEEE International Conference on Software Engineering and Service Science (ICSESS)*, Sep. 2015, pp. 681-685.
- [14] S. Dang and P. H. Ahmad, "Text mining: Techniques and its application," *International Journal of Engineering & Technology Innovations*, vol. 1, no. 4, pp. 22-25, 2014.
- [15] S. Sathya and N. Rajendran, "A comprehensive study of text mining approach," *International Journal of Computer Science and Network Security*, vol. 16, no. 2, p. 69, 2015.
- [16] B. Liu, *Sentiment Analysis, 1. Introduction*, Cambridge University Press eBooks, pp. 1-17, 2012.
- [17] M. Bordoloi and S. K. Biswas, "Sentiment analysis: A survey on design framework, applications and future scopes," *Artificial Intelligence Review*, vol. 56, no. 11,

- pp. 12505-12560, 2023.
- [18] E. Divya and S. Singla, "Sentiment analysis," *Environmental Science, Computer Science*, 2016.
- [19] J. Cao, J. Li, M. Yin, and Y. Wang, "Online reviews sentiment analysis and product feature improvement with deep learning," *ACM Transactions on Asian and Low-Resource Language Information Processing*, vol. 22, no. 8, pp. 1-17, 2023.
- [20] S. Chalupa, M. Petricek, and K. Chadt, "Improving service quality using text mining and sentiment analysis of online reviews," *Quality-Access to Success*, vol. 22, no. 182, 2021.
- [21] D. Sprague, "The History of Online Reviews and How They Have Evolved, Shopper Approved." <https://results.shopperapproved.com/blog/the-history-and-evolution-of-online-reviews>, 2023.
- [22] HEC Paris, "Electronic Word of Mouth: What Marketers Need to Know," <https://www.hec.edu/en/electronic-word-mouth-what-marketers-need-know>, 2022.
- [23] F. R. Jimenez and N. A. Mendoza, "Too popular to ignore: The influence of online reviews on purchase intentions of search and experience products," *Journal of Interactive Marketing*, vol. 27, no. 3, pp. 226-235, 2013.
- [24] L. Zhou, "Online Review Statistics: The Definitive List," <https://www.luisazhou.com/blog/online-review-statistics/>, 2024.
- [25] K. L. Revathi, A. R. Satish, and P. S. Rao, "Feature level fine grained sentiment analysis for classifying online restaurant reviews," in *2023 Second International Conference on Electrical, Electronics, Information and Communication Technologies (ICEEICT)*, Trichirappalli, India, Apr. 2023, pp. 1-5.
- [26] J. Menze, "TripAdvisor Trusted Dining Resource," <https://www.phocuswire.com/TripAdvisor-trusted-dining-resource>, 2018.
- [27] TripAdvisor, "Travelers Push Tripadvisor Past 1 Billion Reviews & Opinions!" <https://ir.tripadvisor.com/news-releases/news-release-details/travelers-push-tripadvisor-past-1-billion-reviews-opinions>, 2022.
- [28] MICHELIN Guide, "History of the MICHELIN Guide," <https://guide.michelin.com/th/en/history-of-the-michelin-guide-th>, 2024.
- [29] The MICHELIN Guide UK Editorial Team, "What is a Michelin Star? MICHELIN Guide," <https://guide.michelin.com/us/en/article/features/what-is-a-michelin-star>, 2024.
- [30] F. Ferrari, "What Does a Michelin Bib Gourmand Award Mean? All the Criteria," <https://www.finedininglovers.com/article/what-is-michelin-bib-gourmand>, 2022.
- [31] R. H. Khan and F. N. Aditi, "Factors affecting eating out in restaurants: A study on customers of Dhaka City," *Global Journal of Management and Business Research*, 2020.
- [32] P. Rita, C. Vong, F. Pinheiro, and J. Mimoso, "A sentiment analysis of Michelin-starred restaurants," *European Journal of Management and Business Economics*, vol. 32, no. 3, pp.276-295, 2023.
- [33] R. B. Barrera, "Identifying the attributes of consumer experience in Michelin starred restaurants: A text-mining analysis of online customer reviews," *British Food Journal*, vol. 125, no. 13, pp. 579-598, 2023.
- [34] A. Garg and M. Amelia, "The first impression in a fine-dining restaurant. A study of C Restaurant in Tampere, Finland," *European Journal of Tourism Hospitality and Recreation*, vol. 7, no. 2, pp. 100-111, 2016.
- [35] The MICHELIN Guide, "103 Restaurants Shine in the INAUGURAL edition of The MICHELIN Guide Hanoi & Ho Chi Minh City, Including 4 MICHELIN Stars," <https://guide.michelin.com/sg/en/article/news-and-views/michelin-guide-vietnam-hanoi-hcmc-2023>, 2023.
- [36] Q. Anh, "Michelin Thay đổi cuộc chơi của ngành ẩm thực Việt Nam thế nào? Du lịch," <https://s.net.vn/wKRo>, 2024.
- [37] Y. Zhong and H. C. Moon, "What drives customer satisfaction, loyalty, and happiness in fast-food restaurants in China? perceived price, service quality, food quality, physical environment quality, and the moderating role of gender," *Foods*, vol. 9, no. 4, p. 460, 2020.
- [38] C. Shin, "Expert opinion and restaurant pricing: Quantifying the value of a Michelin Star," *Stanford Economic Review*, 2018.
- [39] D. Bang, K. Choi and A. J. Kim, "Does Michelin effect exist? An empirical study on the effects of Michelin stars," *International Journal of Contemporary Hospitality Management*, vol. 34, no. 1, 2022.
- [40] C. F. Chiang and H. W. Guo, "Consumer perceptions of the Michelin Guide and attitudes toward Michelin-starred restaurants," *International Journal of Hospitality Management*, vol. 93, p. 102793, 2021.
- [41] A. W. Lohuizen and A. A. T. Barrera, "The influence of online reviews on restaurants: The roles of review valence, platform, and credibility," *Journal of Agricultural & Food Industrial Organization*, vol. 18, no. 2, p. 20180020, 2019.
- [42] R. Ramakrishnan, Y. Di and U. Ramanathan, "Moderating roles of customer characteristics on the link between service factors and satisfaction in a buffet restaurant," *Benchmarking: An International Journal*, vol. 23, no. 2, pp. 469-486, 2016.
- [43] C. Udayalakshmi and J. Sridevi, "Service quality models: A review with respect to fast food restaurants," *BOHR International Journal of Social Science and*

Humanities Research, 2023.

- [44] H. Meladiya, "Pengaruh store atmosphere Terhadap Keputusan Pembelian di Mc Donald's Basuki Rahmat Surabaya," *Journal Pendidikan Tata Niaga*, vol. 2, no. 2, 2014.
- [45] C. Liu, T. M. Kuo, Y. Wang, and Y. Shen, "Perceived luxurious values and pay a price premium for Michelin-starred restaurants: A sequential mediation model with self-expansion and customer gratitude," *International Journal of Hospitality Management*, vol. 103, p. 103185, 2022.
- [46] Q. Gan and Y. Yu, "Restaurant rating: Industrial standard and word-of-mouth: A text mining and multi-dimensional sentiment analysis," in *2015 48th Hawaii International Conference on System Sciences*, Jan. 2015, pp. 1332-1340.
- [47] Michelin Star System, Performance Foodservice, <https://www.performancefoodservice.com/get-inspired/understanding-the-michelin-star-system>
- [48] Apify, Full-Stack Web Scraping and Data Extraction Platform, <https://apify.com/>, 2024.
- [49] G. Barilla, How to Perform Sentiment Analysis in Excel Quickly, <https://www.akkio.com/post/sentiment-analysis-in-excel>, 2024.
- [50] W. Medhat, A. Hassan, and H. Korashy, "Sentiment analysis algorithms and applications: A survey," *Ain Shams Engineering Journal*, vol. 5, no. 4, 2014.
- [51] L. Pacheco, "An analysis of online reviews of upscale Iberian restaurants," *A Multidisciplinary e-Journal*, vol. 32, 2018.
- [52] B. L. Chua, S. Karim, S. Lee, and H. Han, "Customer restaurant choice: An empirical analysis of restaurant types and eating-out occasions," *International Journal of Environmental Research and Public Health*, vol. 17, no. 17, p. 6276, 2020.
- [53] M. Lopez, The Role of Ambiance and Atmosphere in Restaurants, <https://www.linkedin.com/pulse/role-ambiance-atmosphere-restaurants-miguel-lopez>, 2023.
- [54] M. Vietnam, *5 yếu tố chinh phục khách hàng của một quán ăn / nhà hàng*, <https://s.net.vn/WK1v>, 2023.
- [55] L. Muller, Michelin Guide: An Opinion on the first Awards Given in Vietnam, Âm Thực Hiện Đại, <https://amthuchiendai.vn/en/guide-michelin-an-opinion-on-the-first-awards-given-in-vietnam/>, 2024.

AUTHORS



Ha Linh Nguyen received a B.S. degree, majoring in French Culture at Sogang University in 2019, and a M.S. in Arts and Culture Management, Contents Directing Major in Chung-Ang University, Seoul, Korea in 2023. She is a lecturer at the Faculty of International Communication and Culture, Diplomatic Academy of Vietnam, Hanoi, Vietnam. Her research interests include arts and culture management, content management, communication and media, media culture.



Thi Hai Dao received a B.A. degree, majoring in International Communication at Diplomatic Academy of Vietnam, Hanoi, Vietnam in 2024. Her research interests include communication, new media, media culture.

APPENDIX

List of 2023 Vietnam's Michelin-honored restaurant and links in TripAdvisor

SN	Type of restaurant	Restaurant name	Link in TripAdvisor
1	Michelin-starred restaurant (Hanoi)	Gia restaurant	https://www.tripadvisor.com/Restaurant_Review-g293924-d21398846Reviews-Gia_Restaurant-Hanoi.html
2		Hibana By Koki	https://www.tripadvisor.com/Restaurant_Review-g293924-d23745557Reviews-Koki_Capella_Hanoi-Hanoi.html
3		Tam Vi	https://www.tripadvisor.com/Restaurant_Review-g293924-d1763111Reviews-Tam_Vi-Hanoi.html
4	Michelin-starred Restaurant (Ho Chi Minh City)	Anan Sai Gon	https://www.tripadvisor.com/Restaurant_Review-g293925-d12134206Reviews-Anan_Saigon-Ho_Chi_Minh_City.html
5	Michelin-selected restaurant (Hanoi)	A Ban Mountain Dew	https://www.tripadvisor.com/Restaurant_Review-g293924-d25366487Reviews-A_B_n_Mountain_Dew-Hanoi.html
6		Akira Back	https://www.tripadvisor.com/Restaurant_Review-g293924-d14179816Reviews-Akira_Back-Hanoi.html
7		Azabu	https://www.tripadvisor.com/Restaurant_Review-g293924-d16725364Reviews-AZABU-Hanoi.html
8		Backstage	https://www.tripadvisor.com/Restaurant_Review-g293924-d23174811Reviews-Backstage_Capella_Hanoi-Hanoi.html
9		Banh Cuon Ba Xuan	https://www.tripadvisor.com/Restaurant_Review-g293924-d10754889Reviews-Banh_Cuon_Mrs_Xuan-Hanoi.html
10		Bep Prime	https://www.tripadvisor.com.vn/Restaurant_Review-g293924-d23289066-Reviews-Bep_Prime-Hanoi.html
11		Bun Cha Dac Kim	https://www.tripadvisor.com/Restaurant_Review-g293924-d15693433Reviews-Bun_Cha_Dac_Kim_Hang_Manh-Hanoi.html
12		Bun Cha Huong Lien	https://www.tripadvisor.com/Restaurant_Review-g293924-d8088661Reviews-Bun_Cha_Huong_Lien-Hanoi.html
13		Cau Go	https://www.tripadvisor.com/Restaurant_Review-g293924-d6207158Reviews-Cau_Go_Vietnamese_Cuisine_Restaurant-Hanoi.html
14		Cha Ca Anh Vu	https://www.tripadvisor.com/Restaurant_Review-g293924-d3778660Reviews-Cha_Ca_Anh_Vu-Hanoi.html
15		Chapter	https://www.tripadvisor.com/Restaurant_Review-g293924-d25132706Reviews-Chapter_Dining_And_Grill-Hanoi.html
16		Co Dam	https://www.tripadvisor.com/Restaurant_Review-g293924-d22138473Reviews-C_Dam-Hanoi.html
17		Duong s	https://www.tripadvisor.com/Restaurant_Review-g293924-d11729286Reviews-Duong_s_Restaurant_Cooking_Class-Hanoi.html
18		El Gaucho	https://www.tripadvisor.com/Restaurant_Review-g293924-d5963333Reviews-El_Gaucho_Argentinian_Steakhouse_Trang_Tien-Hanoi.html
19		Etēsia	https://www.tripadvisor.com/Restaurant_Review-g293924-d23991783Reviews-Etesia_kitchen_counter_wines-Hanoi.html
20		French Grill	https://www.tripadvisor.com/Restaurant_Review-g293924-d5259465Reviews-French_Grill-Hanoi.html
21		Hemispheres Steak and Hai san Grill	https://www.tripadvisor.com/Restaurant_Review-g293924-d1537464Reviews-Hemispheres_Steak_Seafood_Grill-Hanoi.html
22		Highway4 Hang Tre	https://www.tripadvisor.com/Restaurant_Review-g293924-d858152Reviews-Highway4_Hang_Tre-Hanoi.html
23		Izakaya by Koki	https://www.tripadvisor.com/ShowUserReviews-g293924-d23745557-r931620924-Koki_Capella_Hanoi-Hanoi.html
24		Khoi	https://www.tripadvisor.com/Restaurant_Review-g293924-d25191587Reviews-KHOI_Restaurant-Hanoi.html

SN	Type of restaurant	Restaurant name	Link in TripAdvisor
25		La Badiane	https://www.tripadvisor.com/Restaurant_Review-g293924-d1493448-Reviews-La_Badiane_restaurant-Hanoi.html
26		Labri	https://www.tripadvisor.com/Restaurant_Review-g293924-d23300590-Reviews-LABRI_Oriental_Neo_Bistro-Hanoi.html
27		Le Goût de Gia	https://www.tripadvisor.com/Restaurant_Review-g293924-d23401878-Reviews-Le_Gout_De_Gia-Hanoi.html
28		Ngon Garden	https://www.tripadvisor.com/Restaurant_Review-g293924-d15217909-Reviews-Ngon_Garden-Hanoi.html
29		Oc Di Tu	https://www.tripadvisor.com.vn/Restaurant_Review-g293924-d12342540-Reviews-Snail_Mrs_Tu_Restaurant-Hanoi.html
30	Michelin-selected restaurant (Hanoi)	Oc Vi Saigon	https://www.tripadvisor.com.vn/Restaurant_Review-g293924-d1997978-Reviews-Oc_vi_Saigon-Hanoi.html
31		Pho Ga Cham Yen Ninh	https://www.tripadvisor.com.vn/Restaurant_Review-g293924-d8124638-Reviews-Pho_Ga_26-Hanoi.html
32		Pho Tien	https://www.tripadvisor.com.vn/Restaurant_Review-g293924-d20087391-Reviews-Pho_Tien-Hanoi.html
33		Quan An Ngon	https://www.tripadvisor.com.vn/Restaurant_Review-g293924-d1124698-Reviews-Quan_An_Ngon-Hanoi.html
34		Sente Nguyen Quang Bich	https://www.tripadvisor.com.vn/Restaurant_Review-g293924-d15019956-Reviews-Sente_The_Flavour_of_Lotus-Hanoi.html
35		T.U.N.G. Dining	https://www.tripadvisor.com.vn/Restaurant_Review-g293924-d15618047-Reviews-TUNG_Dining-Hanoi.html
36	Michelin-selected restaurant	Tanh Tach	https://www.tripadvisor.com.vn/Restaurant_Review-g293924-d19758074-Reviews-Tanh_Tach_Seafood_Society-Hanoi.html
37		3G Trois Gourmands	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d1832810-Reviews-Trois_Gourmands-Ho_Chi_Minh_City.html
38		Â by T.U.N.G	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d23087722-Reviews-A_by_TUNG-Ho_Chi_Minh_City.html
39		An s Saigon	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d25211610-Reviews-An_s_Saigon-Ho_Chi_Minh_City.html
40		Ba Co Loc Coc	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d15075572-Reviews-Ba_Co_Loc_Coc-Ho_Chi_Minh_City.html
41		Bep Nha Xu Quang	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d8779309-Reviews-Bep_Nha_Xu_Quang-Ho_Chi_Minh_City.html
42		Michelin-selected restaurant (Ho Chi Minh City)	Bom
43	Bun Thit Nuong Hoang Van		https://www.tripadvisor.com.vn/Restaurant_Review-g293928-d13931944-Reviews-Bun_Thit_Nuong_HVT-Nha_Trang_Khanh_Hoa_Province.html
44	Co Lieng		https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d7813416-Reviews-Co_Lieng_Restaurant-Ho_Chi_Minh_City.html
45	Coco Dining		https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d23949795-Reviews-CoCo_Dining_Whisky_Bar-Ho_Chi_Minh_City.html
46	Da Vittorio		https://en.tripadvisor.com.hk/Restaurant_Review-g293925-d24994864-Reviews-Da_Vittorio_Saigon-Ho_Chi_Minh_City.html
47	Dong Pho		https://en.tripadvisor.com.hk/Restaurant_Review-g293925-d3330826-Reviews-Dong_Pho-Ho_Chi_Minh_City.html
48	Elgin		https://en.tripadvisor.com.hk/Restaurant_Review-g293925-d24190498-Reviews-Elgin-Ho_Chi_Minh_City.html
49		Esta	https://en.tripadvisor.com.hk/Restaurant_Review-g293925-d19073425-Reviews-Esta_Saigon-Ho_Chi_Minh_City.html

SN	Type of restaurant	Restaurant name	Link in TripAdvisor
50		Fashionista Cafe	https://en.tripadvisor.com.hk/Restaurant_Review-g293925-d26742349-Reviews-Fashionista_Cafe-Ho_Chi_Minh_City.html
51		Herve Dining Room	https://en.tripadvisor.com.hk/Restaurant_Review-g293925-d23194602-Reviews-Herve_Dining_Room-Ho_Chi_Minh_City.html
52		Hoa Tuc	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d1569216-Reviews-Hoa_Tuc-Ho_Chi_Minh_City.html
53		La Villa	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d2034882-Reviews-La_Villa_French_Restaurant_by_Thierry_Mounon-Ho_Chi_Minh_City.html
54		Lai	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d15000626-Reviews-Lai_Restaurant-Ho_Chi_Minh_City.html
55		Lua	https://www.tripadvisor.com.vn/Attraction_Review-g293925-d14054034-Reviews-Lua_s_Kitchen_Vietnamese_Homestyle_Cooking_Class-Ho_Chi_Minh_City.html
56		Madame Lam	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d24053236-Reviews-Madame_Lam_Vietnamese_Contemporary_Cuisine-Ho_Chi_Minh_City.html
57		Nen Light	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d24137906-Reviews-Nen_Light_Restaurant-Ho_Chi_Minh_City.html
58		Nous	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d23272774-Reviews-Nous-Ho_Chi_Minh_City.html
59		Oc Dao	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d7061378-Reviews-Oc_Dao-Ho_Chi_Minh_City.html
60	Michelin-selected restaurant (Ho Chi Minh City)	Octo	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d14027845-Reviews-Octo_Tapas_Restobar-Ho_Chi_Minh_City.html
61		Okra FoodBar	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d24049573-Reviews-Okra_Foodbar-Ho_Chi_Minh_City.html
62		Olivia	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d25132619-Reviews-Olivia_Dining-Ho_Chi_Minh_City.html
63		Pho Hung	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d3392848-Reviews-Pho_Hung-Ho_Chi_Minh_City.html
64		Pho Viet Nam Quan 1	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d26794670-Reviews-PH_VI_T_NAM_Ph_m_H_ng_Thai-Ho_Chi_Minh_City.html
65		Quince Eatery	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d13738133-Reviews-Quince_Eatery-Ho_Chi_Minh_City.html
66		Rice Field	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d13322323-Reviews-Rice_Field_Homecooked_Vietnamese_Cuisine-Ho_Chi_Minh_City.html
67		Sol Kitchen Bar	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d17642677-Reviews-Sol_Kitchen_Bar-Ho_Chi_Minh_City.html
68		Square One	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d1308585-Reviews-Square_One-Ho_Chi_Minh_City.html
69		Stoker Quan 1	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d8530915-Reviews-Stoker_Woodfired_Grill_Bar-Ho_Chi_Minh_City.html
70		The Monkey Gallery Dining	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d18927790-Reviews-The_Monkey_Gallery_DINING-Ho_Chi_Minh_City.html
71		The Royal Pavilion	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d17414649-Reviews-The_Royal_Pavilion-Ho_Chi_Minh_City.html

SN	Type of restaurant	Restaurant name	Link in TripAdvisor
72	Michelin-	Tre Dining	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d25090825-Reviews-Tre_Dining-Ho_Chi_Minh_City.html
73	selected	Truffle	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d18340675-Reviews-Truffle_Restaurant-Ho_Chi_Minh_City.html
74	restaurant (Ho Chi Minh City)	Vietnam House	https://www.tripadvisor.com.vn/Restaurant_Review-g293925-d1309266-Reviews-Vietnam_House_Restaurant-Ho_Chi_Minh_City.html
