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RESEARCH ARTICLE

Investigating the customer preference towards Michelin restaurants in Europe through Google Reviews

Ledianë Durmishi 1, Anthony Cristian Medina Paredes 2, János Gábor Sávoly 2, Gyöngyi

¹ Hungarian University of Agriculture and Life Sciences, Doctoral School of Economics and Regional Sciences, Páter Károly st. 1. 2100 Gödöllő, Hungary

² Institute of Agricultural Economics Nonprofit Kft., Agri-Economic Modelling Department, Zsil st. 3-5. 1093 Budapest, Hungary

³ Hungarian University of Agriculture and Life Sciences, Institute of Rural Development and Sustainable Economy, Department of Sustainable Tourism, Mátrai st. 36. 3200 Gyöngyös, Hungary Corresponding author: Gyöngyi Kovács. email: kovacs.gyongyi@uni-mate.hu

Abstract – Michelin-starred restaurants are renowned for their use of premium ingredients, and creatively flavored dishes that are consistently prepared to a high degree. Due to the benefits of sharing previous customers' open experiences and opinions, online reviews have grown in importance among future customers as online activities related to the purchase of restaurant services have increased. Online reviews serve as a route for knowledge and help clients perceive risk in a more manageable way. This study contributes to the decision-making processes – an important competitiveness factor of Michelin restaurants – by providing insights into contemporary European customers, who use digital platforms to share their real perceptions of these restaurants' performance across Europe.

The subject of the current study examines the connections between customer preference and Google reviews, particularly in Europe. This paper aims to gain insight, increase knowledge, demonstrate the path of the future, and integrate and provide additional information regarding the issues above. The study used sentiment analysis to look at both short-term and long-term patterns in customer evaluations, demonstrating similar quality tendencies across both time frames. Overall, customers tended to rate the Michelin restaurants positively, with 85% of the sample giving favorable reviews. Slovenia had the highest scores of positive reviews, while the Czech Republic received the poorest reviews. However, no country showed a negative average performance.

Keywords - Online reviews, Michelin Restaurants, Google reviews, Sentiment analysis

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1. Introduction

Considering how much impact premium restaurants have on many aspects of life, it is important to remember that their superior food and drink offerings and elegant interior design are not the only reasons they rank at the top of the market. Regarding the quality of food and drinks, design, influence, and probably a mix of all these factors, luxury restaurants are regarded as being at the top of the industry (Hwang – Hyun, 2012). In rural development and agriculture, the role of smallscale farms with regional identity can be prominent in the

production of high-quality food (Farkas, 2000; 2003). Moreover, a study conducted by Kiatkawsin and Han (2019) underscores significant evidence that dining at upscale establishments can have a significant impact on relationships and be seen as a sign of success. Expanding on this theme, another study by Kiatkawsin and Sutherland (2020) found that consumers' intention to return and willingness to pay a premium is influenced by their meal experience, brand love, and brand reputation. Fine dining establishments were categorized using the Michelin restaurant guide. The study's findings demonstrated that the meal experience scale serves as a basis for building brand trust and effectively measures the performance of the service. Customers' intentions to remain loyal were thus highly predicted by brand love and esteem. Furthermore, brand credibility contributes to the development of the Michelin guide's trust and ultimately indicates the guide's long-term reputation. Another study by Chang et al. (2023) showed that travelers would be prepared to shell out more money to dine at a Michelin-starred restaurant and upgrade to an inner accommodation with a view. In the European gastronomic world, the Michelin Guide, which originated in France, has been around for over a century and has become synonymous with quality catering (Johnson et al, 2005). The rating system, which can give a restaurant 1, 2, or 3 stars, looks at creativity, artistry, technical knowledge, and a range of quality factors that demonstrate complexity. In addition to recognition, there is also a significant commercial benefit to achieving a star (Lane, 2010). In addition to preserving the cultural heritage of gastronomy, the Michelin Guide is also paying increasing attention to the issue of sustainability.

Furthermore, in a related context, it is important to note that the core offering (food quality or item quality) and service have an equal impact on overall satisfaction; however, the core offering has a greater impact on relative satisfaction than the service (Sivadas - Jindal, 2017). In a related vein, the study of Namkung – Jang, (2007) identified that nutritional benefits, taste, freshness, diversity, and temperature are some of the elements that, in accordance, are mostly correlated with food quality. These factors contribute substantially to the overall dining experience and align with consumer expectations, and they are interlinked. Therefore, the hotel and tourism industries heavily rely on consumer word-ofmouth (Fotis et al., 2012). This industry has expanded as a result of the eating-out trend, which was aided by other newer trends including rising income levels and population increase, particularly in urban areas (Sulaiman - Haron, 2013). In numerous research on consumers' restaurant selection behavior, food quality is considered the most crucial factor and is directly related to patron happiness (Bitner-Hubbert, 1994). Cities produce a large amount of data that might be used to enhance the services offered to inhabitants. Millions of users post information online about their interactions with service when they go to a restaurant, a bar, or a movie theatre. These customer-written online reviews (OGRs), which serve as a reflection of the shopping experience, are a crucial component of e-commerce website design (Camilleri, 2020). Internet reviews have been demonstrated to be a reliable source of information for consumers seeking current information on goods and services from other consumers, reflecting those consumers' genuine experiences and opinions (Kuan et al., 2015). Customer happiness, which is seen as a significant driver of customer loyalty and new client acquisition, is heavily stressed in large, competitive service industries. Customer satisfaction is essentially a postpurchase appraisal of the entire customer experience (Mano – Oliver, 1993). Internet reviews are crucial for the restaurant business because an extra star could result in a 5-9% revenue boost for the establishment (Luca, 2011).

The main objective of the present study is to find out the positive, neutral and negative attitude of the European customer towards Michelin restaurants throughout Google

reviews, measured by a sentimental analysis. Since this type of restaurant offers premium quality products and services, our expectation is that most European customers tend to rate Michelin restaurants positively. This study fills an important gap in the decision-making process by categorizing customer attitudes and providing scientific information to Michelin starred restaurants, enabling them to better manage their investments and efforts based on customers' needs.

2. LITERATURE REVIEW

Over the last ten years, online reviews have emerged as a significant source of customer experience information, with Google being one of the most representative review platforms in the industry. Online reviews offer several advantages compared to conventional approaches, including easier access to data, quicker collection processes, and non-intrusiveness with human subjects (Mathayomchan – Taecharungroj, 2020).

Furthermore, online reviews play a crucial role in the process of selecting and recognizing products and services. Customers perceive both the source and quality of information as crucial indicators of reliability. For this reason, Michelin-starred restaurants, particularly prominent in the European market (Statista, 2024), receive great status and visibility in addition to the distinction, and many food establishments have reported an increase in business after receiving their stars (while some lost stars have experienced the opposite) (Susskind, 2002). If a restaurant's primary offerings fall short of customers' expectations, they will not stay there for very long. Therefore, it is crucial to look at the fundamental aspects of customer interactions, as they are the key areas through which businesses most distinctly set themselves apart from their rivals, as stated by Filieri's study (2016).

Social media, acting also as a review platform, has made it possible for every user to post their opinions, views, and preferences about a wide range of topics, influencing our propensity to buy and shaping the decisions made by product and service designers. Preference is seen to be both an external perception of a product and a window into a person's inner thoughts (Cao et al., 2013). Customer preference is adjustable about scene, time, and attribute. The duration is unknown and is dependent on the product category. It varies in length from time to time. The scene is connected to many cultures and regions, depending on the actions of the customers (Chen et al., 2003).

Recognizing the nuanced nature of customer preference, businesses regularly conduct direct surveys, or queries about customer preferences, in order to better serve their clients and increase their level of product satisfaction (Bolton, 1998). Surveys are sometimes referred to as casual discussions between customers and product creators. There are several ways to carry out the survey. Asking clients about their preferences for certain product functions, features, shapes, costs, or even service quality is a very popular approach. In survey questions, a scale is frequently used to extract judgments or preferences. The value of the labels may be

biased against the results that are chosen based on the preferences of the individual customers (Mugge et al., 2009).

Beyond traditional survey methodologies, the advent of natural language processing (NLP) has revolutionized the understanding of customer sentiments. One of the most important uses of natural language processing is sentiment analysis, which helps hospitality and tourism companies better understand the needs and sentiments of their patrons by gathering and examining feedback from online review sites like TripAdvisor (Patel - Patel, 2021). Since the 1990s, sentiment analysis has been used as a tool to identify motivations. Opinion mining is another similarly comparable phrase that is used in conjunction with sentiment analysis. Sentiments are rated as pleasant, negative, or neutral, after which a task-specific analysis is carried out. Users may post anything they choose. Posting their opinions and views about a wide range of topics is one of those things (Pang – Lee, 2008).

These sentiments, expressed through online reviews, hold substantial sway over businesses. In addition to the significance of tourism, gastronomy, and rural development, reviews have a significant impact on Michelin Restaurants, increasing sales and enhancing website rankings. Customers frequently read reviews posted online by visitors to the location (restaurant) in addition to looking for information on how the location is rated. These opinions can be expressed by professionals, such as food critics or journalists who focus on the topic, or simply by customers who want to talk about their dining experiences (Parikh et al., 2017). Due to the proliferation of review websites, many tourists have booked a table in advance online or decided to visit a popular restaurant after reading online restaurant reviews (ORRs). Customers use ORRs to learn about restaurant experiences from other customers' prior experiences (Jeong – Jang, 2011). On account of the intangible and complex nature of experiences, goods, and services in the tourism and hospitality sectors in particular, consumers heavily rely on customer reviews to assess service quality prior to consumption; as a result, online consumer reviews are seen as crucial to purchasing decisions (Korfiatis et al., 2012). Furthermore, according to the study carried out by Jeong -Jang (2011), the selection of hotels and restaurants is significantly influenced by online reviews and comments.

Online reviews serve as a form of electronic word-of-mouth and are a valuable information source that lets users of review websites conduct in-depth information searches (Racherla -Friske, 2013). It has been demonstrated that word-of-mouth marketing, which includes both positive and bad reviews of customer service interactions, has an impact on how other people behave when making purchases. Good word-of-mouth is said to spread after satisfying service encounters, and negative word-of-mouth typically spreads after unpleasant ones (Naylor - Kleiser, 2000). A few research have shown that consumers spread their opinions more than unhappy customers do (Swan – Oliver, 1989), while other studies have shown a U-shaped relation in which intensive word-of-mouth spreading is most closely correlated with either very satisfied or highly dissatisfied customers (Anderson, 1998). However, according to some studies, unhappy clients spread their negative experiences more widely than pleased ones

(Davidow – Leigh, 2002). WOM is a way to express one's feelings in society. Social psychologists have long studied this emotional exchange, and as a result, there is a wealth of literature that sheds light on many of its facets (Rimé et al., 1991) that is one reason why Michelin Restaurants are great example of content marketing involving producing and distributing useful material for a specific demographic and attracting devoted clients, winning the consumers through unique and quality content (Daries-Ramon et al., 2017)

3. METHODOLOGY AND DATA COLLECTION

This study provides insights into the online performance of Michelin-starred restaurants, particularly in Europe, through the reviews made by customers on Google Maps. Primary and secondary data are also used in this study. The study's first section is based on a review of the literature, while its second section is based on primary data. The secondary data are acquired from publications like books, journals, and articles. Using online review data to examine consumer attitudes toward dining has three benefits. Primarily, it offers impulsive consumer attitudes in authentic consumption contexts. In comparison to other types of data, this can offer more accurate information about consumer dining experiences. Furthermore, it includes extensive information. This continues with the fact that they are easily available on many important platforms and are supported by huge sample numbers (Vidal et al., 2016). Online evaluations, particularly on platforms such as Google Maps, have a significant impact on consumer perceptions and decisions, with favorable feedback leading to greater income and reputation. Our study focuses on Europe, encompassing an evaluation of 18 countries within the continent. Specifically, our analysis examined a total of 1,191 restaurants, focusing on the examination of 37,167 customer reviews about Michelinstarred dining establishments.

It is worth noting that the outcomes may vary depending on the social media platform where the reviews were posted. Research conducted by Rita et al. (2023) across 87 Michelinstarred restaurants in Europe using the platform 'Trip Advisor' revealed that English-written reviews exhibited an overall decrease in sentiment following the awarding of Michelin stars. In contrast, our study observed an increase in sentiment, considering reviews in multiple languages. This disparity in findings underscores the importance for restaurants to discern which social media platforms require greater attention and to find out the platform that their target clients use.

In order to collect data from Google Maps reviews, programming codes in Python were employed. For the sentiment analysis, the data underwent analysis utilizing the Microsoft Azure Machine tool. The Azure Sentiment Analysis (SA) model was developed within Microsoft Azure. This model was specifically designed to detect textual sentiments. The process involved constructing the Azure ML model, training it to recognize different sentiments, and establishing it as a predictive model capable of categorizing sentiments as either neutral, negative, or positive (Harfoushi et al., 2018).

A part of our study is supported by data from internet reviews, which may be generally classified into two categories:
(i) computer science research concentrates on creating data utilizing online review data as tools to test the algorithms,
(ii) and secondly marketing research focusing on predicting

(ii) and secondly marketing research focusing on predicting customer choice, product sales, and making marketing strategy decisions.

The present study is cross-sectional because the data collected, and the analysis are held in a determined period. We collected reviews from Google Maps without language restrictions, which were automatically translated into English using Google Translator before the scraping process. Using Python, we scraped the reviews and cleaned the data by selecting only the reviews made by customers, excluding responses from restaurants to customer comments. After this selection process, the information was entered into Microsoft Azure Machine Learning and Excel for evaluation, in which descriptive statistics were applied by transferring the coded data from the instruments used to the program, to then apply a process of tabulating the results and simplifying the analysis information for its subsequent description and interpretation; as well as inferential statistics by using Pearson value for the analysis of the correlation between the variables.

The general design of the investigation corresponds to a quantitative approach when collecting numerical data to test the expectation through statistics, it is non-experimental because the variables have not been manipulated and the phenomena were observed in their natural environment. This study is transactional because the data collection was carried out in a single space of time, correlational since the relation between the variables will be evaluated through statistical techniques, and finally, the research was conducted at a nominal level since the obtained results do not indicate a hierarchy.

The tool used in this research, "Microsoft Azure Machine Learning", it is part of the Microsoft Language Service that offers features such as sentiment analysis and opinion mining, which are powered by a collection of machine learning and AI non-public algorithms. These tools are designed to aid in the development of intelligent applications that deal with written language. The sentiment analysis feature assigns sentiment labels, such as "negative," "neutral," and "positive," based on the highest confidence score detected by the service at both sentence and document levels. Additionally, this feature provides confidence scores ranging from 0 to 1 for each document and the sentences within it, indicating the degree of positive, neutral, and negative sentiment (Microsoft, 2024).



Figure 1. Flowchart of the research process. Source: Own elaboration based on the present research information, 2024

4. RESULTS

The analysis was conducted on 42,014 reviews obtained from 1,191 restaurants across 18 European countries, regarded as a representative sample for examining the European market of Michelin restaurants. The findings are presented, ranging from a broader to a more detailed level of analysis. Following a cleaning process, 4,847 reviews were excluded as they consisted of restaurant feedback to customer reviews, rendering them unsuitable for inclusion in this study. Ultimately, 37,167 reviews were considered, representing

genuine opinions derived from individuals' experiences at the Michelin restaurants under study.

Table 1 provides a full analytical summary, revealing that favorable evaluations, with an average rating of 0.85, suggest that those motivated to write commendations choose to communicate entirely good comments. In a similar vein, people who expressed neutral views averaged at 0.53, and those who left unfavorable remarks, averaged 0.16, indicating that consumers easily develop distinct stances when assessing a Michelin restaurant. Customers generally supply either very favorable or severely negative feedback, or they preserve a distinctively partial opinion.

Table 1. Sentiment analysis – General score average. Source: Own elaboration based on the present research results analysis, 2023

Sentiment	Average of Score		
positive	0.85		
neutral	0.53		
negative	0.16		

Table 2 depicts the distribution of scores across categories. According to the table, 80% of consumers have given the restaurants good reviews. Negative comments come in second with 15% of the answers, while neutral evaluations account for 5% of the total. These findings show that the majority of people who review a Michelin restaurant tend to

give positive feedback, exhibiting their willingness for making good comments. The reviews were given based on customer service, food quality, ambiance and design, and value for money (Barrera-Barrera, R., 2023).

Table 2. Sentiment analysis – Percentage of reviews in each category. Source: Own elaboration based on the present research results analysis. 2023

Sentiment	% in each category	
positive	80%	
neutral	5%	
negative	15%	

Figure 2 depicts the findings from several nations during one year, including accessible data and reviews for each country. The graph shows that Slovenia, the Netherlands, and Luxembourg have the highest customer ratings among the countries surveyed, whereas the United Kingdom, Estonia,

and the Czech Republic have comparably lower customer ratings. Nonetheless, it is critical to underline a positive trend in evaluations over the previous year, from June 2022 to June 2023, since all nations have sentiment ratings greater than 0.6.

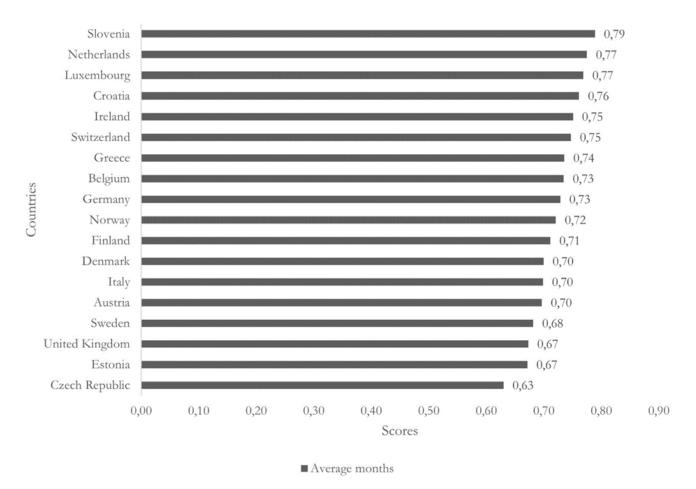


Figure 2. Sentiment analysis – Average by Country within one year. Source: Own elaboration based on the present research results analysis, 2023

Figure 3 depicts a comparison between sentiment analyses conducted over the past year and specifically in June 2023. This analysis offers insights into short-term future trends. The Pearson correlation shown in Table 3 revealed a positive-moderate relationship between monthly and yearly results,

suggesting that customer reviews regarding restaurants exhibit consistent tendencies in quality over both short and longer time frames..

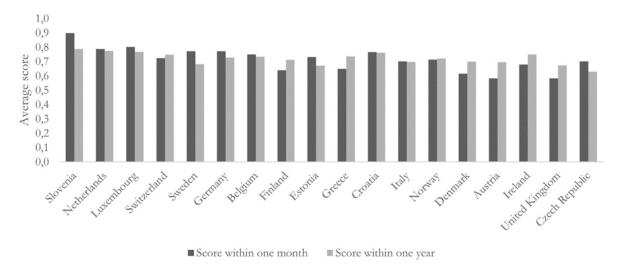


Figure 3. Sentiment analysis – Scores within one year and one month. Source: Own elaboration based on the present research results analysis, 2023

Table 3. Pearson correlation between sentiment scores within one month and one year. Source: Own elaboration based on the present research results analysis, 2023

Pearson correlation	Score within one month	Score within one year	
Score within one month	1		
Score within one year	0.56	1	

Finally, Table 4 provides a summary of total ratings across nations without regard to time constraints. When compared to a longer time frame, evaluations from the previous year show a more favorable trend in ratings. This pattern suggests that

people routinely give better ratings to eateries. A future study might look at the variables that have contributed to this increase in favorable reviews.

Table 4. Sentiment an<u>alysis – Average by country. Own elaboration based on the present research</u> results analysis, 2023

Sentiment score

Country	Negative	Neutral	Positive	Grand Total
Austria	0.16	0.52	0.85	0.51
Belgium	0.17	0.53	0.83	0.51
Croatia	0.15	0.53	0.85	0.51
Czech Republic	0.15	0.55	0.84	0.51
Denmark	0.16	0.53	0.84	0.51
Estonia	0.11	0.53	0.86	0.50
Finland	0.18	0.54	0.85	0.52
Germany	0.16	0.53	0.86	0.52
Greece	0.16	0.53	0.86	0.52
Ireland	0.17	0.53	0.83	0.51
Italy	0.15	0.54	0.84	0.51
Luxembourg	0.17	0.54	0.84	0.52
Netherlands	0.18	0.54	0.85	0.52
Norway	0.18	0.53	0.82	0.51
Slovenia	0.32	0.53	0.85	0.56
Sweden	0.18	0.54	0.85	0.52
Switzerland	0.16	0.54	0.85	0.52
United Kingdom	0.15	0.53	0.85	0.51

4. DISCUSSION AND CONCLUSIONS

Premium restaurants, particularly Michelin restaurants, possess significant influence beyond their food and beverage offerings and therefore are associated with success, influencing consumers' intention to return and willingness to pay a premium. This research brings new insights into customer satisfaction in high-end restaurants, especially Michelin Restaurants, and shows the importance of Internet reviews for shaping consumer opinions and restaurant reputation.

The results highlight the significance of consistent patterns in consumer sentiment over time, regional differences in satisfaction levels, and high-quality service. From this research, it is concluded that the average score of positive ratings was 0.85. This score can be attributed to the particular focus of these restaurants on service quality and customer experience. Furthermore, it was noted that neutral ratings averaged 0.53. Most of these customers highlighted room for improvement, indicating a need for more creative menu items and distinctive cooking. Additionally, the average rate of dissatisfaction with the services provided by Michelin restaurants was 0.16. The main reason for this discontent was the differences between what customers expected and what they experienced when dining. Moreover, our research delved into the distribution of scores across various categories. A substantial portion of the respondents, comprising 80% of the sample, provided positive reviews for the restaurants under review. On the other hand, 15% of respondents expressed dissatisfaction, while a smaller subset of 5% maintained a neutral stance in their reviews.

Sentiment analysis conducted across 18 European countries finds a predominance of positive evaluations, indicating general contentment with Michelin restaurants, with Slovenia ranking first in customer satisfaction and emerging as the highest-ranked country among the samples, boasting an overall score of 0.79 out of 1 within a year of analysis. Within one month of analysis, Slovenia maintains the leading position with a score of 0.90. Conversely, the Czech Republic occupies the last position in the analysis within a year, with a score of 0.63. The outlook appears promising, with increasing customer satisfaction over time. Results without time considerations hover around 0.5, while ratings in the last year average 0.7 across most countries. This upward trend indicates a growing satisfaction among customers towards Michelin-starred restaurants.

Additionally, a positive-moderate correlation can be shown when sentiment analyses from June 2023 are compared to those from the previous year. This suggests that, both in the short and long term, customer reviews of restaurants show persistent quality characteristics. As a result, it makes sense to assume that the opinions shared in customer reviews follow consistent trends. Furthermore, our study analyzed reviews without considering specific timeframes, and it's concluded that restaurants generally gain higher ratings with time, regardless of the country.

Our research gives significant practical implications for restaurant management and marketing strategies, especially for Michelin restaurants, known to be high-end businesses. Additionally, those restaurants are known for the impact on customers' intentions to return and their willingness to pay more for experience, in addition to their food offerings. This is concluded also from the study of Li. X. et al, (2023), where service quality and perceived value for money have an impact on the dining experience for customers, and shifts in the Michelin star ranking have an impact on customers expectations and priorities. Therefore, the Michelin Restaurants can benefit from our research in identifying the countries that receive lower satisfaction, which in our case is the Czech Republic, and perform necessary improvements to raise the customer's satisfaction. Furthermore, our findings underscore the importance of prioritizing service quality, managing customer expectations, and adapting to evolving consumer preferences in the management and marketing strategies of premium restaurants like establishments.

Limitations of the study

This study has potential limitations. The research contains empirical limitations, in geographical scope, sampling bias, and language barriers. Even though the study is focused on Europe, it may be limited to different economic factors and culinary traditions that may differ in countries. Moreover, the study relies on online customer reviews, therefore it captures only the opinions of customers who actively engage with online reviewing. Also, the language barrier represents another limitation because the online reviews can be in different languages, and their translation may impact the accuracy of the sentiment analysis. Therefore, further research into those perspectives could contribute to the significant reliability of customer satisfaction in Michelin Restaurants.

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