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## The Application of Web Scrapping Method to Evaluate the Customers' Inclination to Share the Online Word-of-Mouth in Hotel Sector: The European Perspective

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### Abstract:

**Purpose:** The existing literature on electronic word-of-mouth (eWOM) in the accommodation establishment<sup>7</sup> industry lacks comprehensive analysis of how specific factors, such as hotel attributes and customer behaviours, impact the effectiveness of eWOM in influencing consumer decision-making. This gap is especially critical in a rapidly evolving digital environment where eWOM plays an increasingly significant role in shaping market dynamics. As consumer-generated content continues to grow in importance, understanding the drivers of eWOM is essential for both academic research and practical applications in business strategy. The aim of this study is to evaluate the influence of hotel characteristics, such as star ratings, proximity to city centres, and sustainability certifications, on the sentiment expressed in eWOM.

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<sup>7</sup>The accommodation establishment refers to any facility that provides lodging services to travellers, tourists, or temporary residents. These establishments vary in their levels of service, size, and amenities, and can range from basic to luxury options. The term includes hotels, motels, bed & breakfasts (b&bs), hostels, and resorts. In this paper, the terms "accommodation establishment" and "hotel" will be used interchangeably.

**Design/Methodology/Approach:** In the paper the following assumptions have been made: hotels with higher ratings, strategic locations, and eco-friendly certifications receive more positive eWOM, which in turn influences consumer purchasing decisions. In the study two hypotheses were formulated: H1: Among the analysed factors affecting the probability of a positive reviews by guests, the high category of the accommodation establishment (number of stars) has a strong influence. H2: National diversity influences sentiment variability. Data for this study were collected through web scraping of Booking.com over a two-year period (2021-2024), followed by sentiment analysis using the VADER model. Logistic and probit regression models were employed to assess the impact of key variables on review sentiment.

**Findings:** The findings confirm that positive eWOM is strongly associated with a set of different factors like hotel ratings, closer proximity to central locations, and sustainability certifications. These factors contribute significantly to value co-creation, fostering customer loyalty and influencing future bookings. However, the study is limited by its focus on European cities and the use of secondary data from a single platform.

**Practical Implications:** The practical business implications mainly relate to the possibility for entrepreneurs. Future research should expand geographically and incorporate primary data collection to enhance the generalizability of findings. Additionally, exploring the role of emerging technologies, such as AI-driven reviews, in eWOM communication presents an exciting avenue for further research.

**Originality/Value:** The study underscores the increasing importance of eWOM in the hotel industry, particularly as more consumers rely on online reviews to make informed booking decisions. In an era where digital platforms dominate consumer interaction, eWOM has emerged as a powerful tool for shaping business outcomes. Positive eWOM enhances a hotel's reputation and drives bookings, while negative reviews can quickly damage brand perception.

**Keywords:** Company-Customer interactions, consumer behavior, electronic word-of-mouth (eWOM), hotel management, web scraping method, marketing strategy.

**JEL Classification:** M310, M10.

**Paper type:** Research article.

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## 1. Introduction

Novum of the paper is the relationship perspective. As company-customer interactions are at the centre of the research (Mitreęa *et al.*, 2022; Gong and Yi, 2019; Vargo *et al.*, 2008), our study on customer-to-customer relationship, with a focus on word-of-mouth communication, fills a gap in the existing literature. Word of mouth (WOM) as a marketing concept was introduced in the 1950 s (Brooks, 1957).

Its rapid growth came with the development of the Internet (Dellarocas, 2003). Hennig- Thurau *et al.* (2004) explored how the Internet age had allowed individual consumers to engage in electronic word of mouth (eWOM) via consumer-opinion platforms.

Despite these early efforts and the ongoing attention devoted to the examination of eWOM, there have been renewed calls for a more nuanced understanding of eWOM in order to maximize its business value (Babić Rosario *et al.*, 2020). The evolution of Web 2.0 technologies in particular has changed the landscape of marketing communications across Business-to-Consumer, Business-to-Business and Consumer-to-Consumer (Liu, Shaalan, and Jayawardhena, 2022).

With the advent of text, voice, and video-based social media, eWOM has increased multi-fold. Previously eWOM tended to be one-to-one communication, however, has now evolved into many-to-one and even many-to-many interactions, leading to the evolution of eWOM 2.0. Such changes pose interesting interactions among customers, organizations and other stakeholders involved in eWOM 2.0. (Liu *et al.*, 2024).

The topic of electronic word-of-mouth (eWOM) is increasingly important and dynamic, particularly in the context of the hotel industry, which is heavily reliant on customer feedback and online reputation (Yang, 2017, p. 20). With the rapid digitalization of the travel and hospitality sector, consumers are turning to online reviews, recommendations, and social media to make informed decisions, making eWOM a crucial factor in shaping business outcomes.

Unlike traditional marketing channels, eWOM carries the unique advantage of perceived authenticity and trust, as it comes directly from other consumers. As a result, it often has a stronger influence on purchasing decisions than advertising or promotions (Attaallah, 2022, p. 13).

The hotel industry, where service quality and customer satisfaction are paramount, is especially affected by eWOM. Positive or negative online reviews can significantly impact a hotel's reputation, occupancy rates, and pricing strategies. In this highly competitive environment, businesses must understand how to manage and influence eWOM effectively to ensure customer loyalty and long-term success.

The evolving nature of digital platforms and the increasing importance of customer-generated content make this topic not only relevant but also a key area for future research and strategic business development (Marino, Pariso, and Picariello, 2022).

This paper examines key themes, including customer citizenship behaviour (CCB), value co-creation, and the influence of hotel characteristics like star ratings, location, and sustainability certifications. These themes are valuable because they address

how hotels can enhance customer engagement, foster positive feedback, and mitigate negative reviews, which are crucial for shaping brand perception.

The study explores customer-to-customer communication in the online space, focusing on factors like message credibility, reviewer motivation, and sentiment, which impact the spread of eWOM. By analysing these aspects, the article moves beyond traditional marketing, showing the active role customers play in influencing the market image of hotels. This approach is vital for developing strategies that encourage positive eWOM and manage its effects on business performance.

## **2. Word-of-Mouth as Form of Customer Citizenship Behaviour – Theoretical Framework**

Dynamic market conditions and the competitive environment have placed consumers in a crucial position. This shift is evident in the strategies businesses employ. Managers now understand that their current and potential customers are more influential than ever before (Sheth *et al.*, 2023, pp. 1-2).

According to this concept, the marketing effectiveness of companies is depended on its partnering, advantageous relationships with customers. Simultaneously, a relationship evolution has taken place: from reactive customers' behaviours, which may be described as their positive or negative reactions to marketing actions undertaken by a company, towards proactive ones.

Customers initiate these behaviours and address them both to companies and other customers. The proactive behaviours may be defined as customers' citizenship behaviours (CCB), which is commonly referred to as discretionary and voluntary behaviour, for which no remuneration is provided (Dewalska-Opitek and Wiechoczek, 2017, p. 248; Tonder and Petzer 2018, pp. 393).

Literature studies prove that customer citizenship behaviour is a multidimensional construct consisting of several dimensions. According to Dewalska-Opitek and Mitręga (2019, pp. 49.) the following forms of CCB may be identified:

- a. customer behaviour that involves the provision of information and (positive or negative) opinions regarding companies, their goods, and services, with the intention of improving the marketing activity (co-creation, voice, consultancy),
- b. customer behaviour that involves encouraging other customers (friends, family members, Internet users, etc.) to use goods or services of a company, positive word-of-mouth (WOM) and recommendations (advocacy),
- c. customer behaviour that displays the commitment to a company, a favourable attitude towards its products, services, and marketing activity by presenting a company's logotype (on clothes, bags, etc.), presenting the involvement in marketing events provided by a company (displaying affiliation, social support),

- d. customer behaviour consisting of helping other customers when the use of a product or company processes may be troublesome and uneasy for other customers, benevolent acts of service facilitation towards other customers (helping other customers),
- e. customer behaviour that involves observing other customers aiming to eliminate inappropriate behaviour, e.g. not respecting the queue, misbehaving on the company's fan page, being rude to other customers (mitigating, policing).

Word-of-mouth communication, which is the subject of interest in this paper, significantly influences other customers' purchasing intentions, decisions and buying behaviour (Senbabaoğlu and Danaci, 2023, pp. 198). It may be observed that consumer-to-consumer impact can sometimes surpass the impact of traditional business-to-consumer marketing tools like advertising, public relations, sales promotion, direct marketing, and personal selling (Kimmel and Kitchen, 2014).

Word-of-mouth (WOM) is referred to as sharing positive opinions about brands, products, and companies, and encouraging other buyers (such as friends, family, and Internet users) to purchase the offerings of a specific enterprise (Dewalska-Opitek and Mitreğa, 2019). Lo (2012) defines WOM as "the process of transferring information from one person to others."

Gruen, Osmonbekov, and Czaplewski (2006) describe it as "communication between consumers who exchange knowledge about a company and its products, share information about the offered values, their attitudes towards them, and purchase intentions." WOM is also widely regarded as one of the most significant manifestations of customer loyalty (Siemieniako, 2010, pp. 2-7).

When the customer-to-customer communication takes place in online environments it is considered as electronic word-of-mouth (E-WOM or eWOM). Godes and Mayzlin (2004, pp. 545-547) define e-WOM as a measurable communication tool, exemplified by reviews written for any product on websites.

Compared to offline environments, online discussion exhibits specific characteristics. Firstly, it allows for worldwide reach. Customers may communicate with other customers from various parts of the globe, lowering communication barriers among interacting individuals (Tuncdogan and Hughes, 2023, pp. 128).

The global nature of the internet has fostered e-WOM communication between consumers who may be strangers, but it facilitates enhanced social interaction (Gruen *et al.*, 2006, pp. 450-452). Consumers can engage in the e-WOMM process through websites, blogs, chat rooms, or email (Hennig-Thurau *et al.*, 2004, pp. 40), allowing for further proliferation of eWOM. Furthermore, digitalisation of media has developed the one-way communicative traffic into a two-way conversation among many Internet users.

Consequently, online platforms and social media allow users to generate content. Since algorithms were implemented, online platforms may learn from users' inputs and reactions, shaping the content to some extent (Tuncdogan and Hughes, 2023, pp. 123-124). The written and recorded nature of eWOM makes the communication easier to measure than traditional WOM, enabling companies to learn about their customers through the online reviews that are posted, and to adapt their product in accordance with this feedback (Cantalops and Salvi 2014, pp. 43).

Online communication also provides marketers with better opportunities to manage the word-of-mouth information (Huang *et al.*, 2011, pp. 1277-1280; Huang and Chang, 2020, pp. 2515-2520). The planned communication activity through WOM or eWOM is referred to as electronic word-of-mouth marketing (eWOMM) (Dewalska-Opitek and Mitreğa, 2018, pp. 106-107).

Lo (2012, pp. 189-190) points out the exchange of both positive and negative opinions among consumers within the framework of WOM, which consequently either encourages or discourages the purchase of products or the use of a specific company's offerings. While sharing negative opinions with other users can be seen as a form of civic behaviour conducted in the interest of other consumers, this study focuses on the dissemination of positive opinions.

This aligns with another dimension of CCB, namely advocacy. The literature includes the term customer advocacy, understood as "providing other buyers with reasons to collaborate with a specific enterprise," or brand advocacy, which refers to "spreading a good reputation about a brand (product or company)." In this context, the concept of word-of-mouth is explained (Mitreğa *et al.*, 2022, pp. 30-31; van Tonder and Petzer, 2018, p. 397).

A substantial body of literature (Tuncdogan and Hughes, 2023, p. 129; Bhat and Bhat, 2020, pp. 97-99; Mehya *et al.*, 2020, pp. 183-186; Tien *et al.*, 2019, pp. 240-242; Erkan and Evans, 2016, pp. 48-51) explores numerous factors that influence the persuasiveness of electronic word-of-mouth (eWOM) communication. These factors can be categorized into three main categories, i.e., characteristics of the sender, characteristics of the receiver, and situational factors, which include the content of the communication and the context in which it occurs, perceived usefulness of information, and social relationships among actors (i.e., tie strengths and homophily).

In the communication process, the sender is the person who starts a message, often referred to as the communicator or source. This sender could be a speaker, a writer, or someone using gestures. In communication and speech theory, the sender's reputation plays a crucial role in ensuring the audience perceives the communication as high quality (De Loof, 2024, p. 2418). Source credibility theory identifies source expertise and source bias as factors influencing the credibility of an information source (Brown *et al.*, 2007, pp. 6-7; Buda and Zhang, 2000, pp. 229-242).

Source expertise refers to the perceived competence of the source delivering the information. Source bias, also known as source trustworthiness, pertains to any potential biases or incentives that might affect the source's information (Chafii *et al.*, 2024, pp. 869). A source is deemed more credible when it has higher expertise and lower bias.

According to the elaboration likelihood model (cognitive response theory), persuasion depends on the recipients' involvement in the outcome and the communicator's credibility (Brown *et al.*, 2007, pp. 7). Attribution theory posits that when consumers receive a message, they assess its accuracy.

If the message lacks credibility, it will be dismissed and not persuasive. A message sender is considered an "expert" (and thus highly credible) based on their knowledge and unique position derived from their occupation, social training, or experience.

However, in an online environment, these evaluations rely on impersonal text-based exchanges provided by site network actors. With limited knowledge of the individual's attributes and background, evaluations occur in a reduced- or altered-cues environment (Chafii *et al.*, 2024, pp. 870; Buda, 2003, pp. 158).

In terms of information receivers, two characteristics are taken into consideration, i.e., attitudes and motives. An attitude as a mental or neural state of readiness, organized through experience, exerting a directive or dynamic influence on the individual's response to all objects and situations to which it is related.

In other words, an attitude is a mindset or a tendency to act in a particular way due to both an individual's experience and temperament (Verplanken and Orbell, 2022, pp. 328). Wood and Wood (1980), followed by Olufemi (2012, pp. 63) defined attitude as a relatively stable evaluation of a person, object, situation, or issue. They identified three components of attitude: cognitive, affective (or emotional), and behavioural.

The cognitive component consists of thoughts and beliefs about the attitudinal object, representing a person's knowledge with varying degrees of certainty about what is true or false, good, or bad, desirable, or undesirable. The affective component encompasses feelings toward the attitudinal object and is capable of arousing varying intensities of emotion centered around the object of belief.

The behavioural component relates to how individuals are predisposed to act toward the attitudinal object, leading to actions when suitably activated. Receivers seek out word-of-mouth (WOM) for distinct reasons, and these motivations influence the impact of WOM. The primary motivation for receivers in browsing WOM is to gather information about products or services prior to making a purchase, significantly affecting market behaviour.

The motivation levels of receivers seeking WOM to inform their decisions vary, influencing their focus on different components of WOM. When motivation is low, receivers tend to concentrate on product popularity and summary statistics, such as average star ratings. In contrast, when motivation is high, receivers pay more attention to specific product information and review text (Doh and Hwang, 2009, p. 805; Martin and Lueg, 2013, p. 195; Wu *et al.*, 2015, p. 740).

Moreover, due to the often-voluminous nature of WOM, even initiative-taking receivers may adopt selective processing strategies, focusing on only certain components of WOM (Moore and Lafreniere, 2020, pp. 35-36).

The effectiveness of electronic word-of-mouth communication can be influenced by its features, irrespective of the sender or receiver. High-quality arguments in eWOM, with vividness and clarity, tend to be more persuasive. The valence, or positivity/negativity, of eWOM has shown mixed results in terms of persuasiveness, though negative messages spread more rapidly on social media.

The subject matter also impacts eWOM value; it is more significant for products or services that cannot be easily trialled or researched beforehand and is crucial for complex or high-risk services. Valos *et al.* (2016) suggest that complex products generate less eWOM on social media due to lower interest levels, and Sano (2015) finds no noteworthy evidence that social media marketing produces positive eWOM for complex services, potentially due to the limited attention span of users (Tuncdogan and Hughes, 2023, pp. 134-137).

The creation of perceived value is also seen as essential for spreading both WOM and eWOM. According to Tonder and Petzer (2018, pp. 396), perceived value comprises of two dimensions: utilitarian value and hedonic value. Utilitarian value refers to the functional worth of an offering and is perceived as cognitive in nature, while hedonic value relates to the emotional worth of an offering and is affective in nature (Sánchez-Fernández and Iniesta-Bonillo, 2007, pp. 436).

All WOM communication takes place within a social relationship that may be categorized according to the closeness of the relationship between information seeker and the source, represented by the construct tie strength. Tie strength is a multifaceted concept that signifies the intensity of dyadic interpersonal connections within social networks and may range from strong to weak depending on the number and types of resources they exchange, the frequency of exchanges, and the intimacy of the exchanges between them (Brown *et al.*, 2007, pp. 4).

Research indicates that tie strength significantly influences the flow of information. Individuals engaged in strong tie relationships exhibit a higher frequency of interaction and a greater volume of information exchange compared to those in weak tie relationships.



Consequently, consumers are more likely to contribute a higher degree of WOM or eWOM communication to strong tie relational partners than to those in weak tie relationships.

Additionally, strong ties exert a more substantial influence on the receiver's behaviour, attributable to the frequency and perceived importance of social contact among individuals with strong ties (Tuncdogan and Hughes, 2023, pp. 132-133).

The construct that is related to tie strength is the construct of homophily, which explains group composition in terms of the similarity of its members. The similarity of individuals predisposes them toward a greater level of interpersonal interactions, increasing the inclination to WOM/eWOM communication (Brown *et al.*, 2007).

### **3. The Role of Word-of-Mouth in Hotel Sector**

The European hotel market represents a dynamic and diverse industry, which is continuously growing (except two main pandemic years, i.e., 2020 and 2021). According to Statista Report (2024), the hotel market in Europe is set to experience a rise in revenue as it is projected to reach US\$114.40 bn by 2024.

This projection is expected to show an annual growth rate (CAGR 2024-2029) of 2.86%, leading to a market volume of US\$131.70bn by 2029. The number of users in this market is expected to increase to 336.80m users by 2029, with a user penetration of 34.0% in 2024 and an estimated rise to 40.0% by 2029 (Adamopoulos and Thalassinou, 2020). The average revenue per user (ARPU) is expected to be US\$0.40k.

The hotel sector in Europe keeps adapting to the evolving needs and preferences of its guests. European customers increasingly seek unique and personalized experiences when selecting hotels. They prioritize accommodations that provide not only comfort and convenience but also a sense of local culture and authenticity.

This shift in preferences has led to a proliferation of boutique hotels and eco-friendly properties, which cater to the rising demand for sustainable tourism practices. It may also be noticed that the predominant form of sale is online sale (78% of sales in 2023) and is predicted to reach 80% in 2024 and 83% of total revenue in the hotels market by 2029 (Statista Report 2024).

New communication platforms have emerged as online communities for sharing information and experiences (Borges-Tiago *et al.*, 2021; Black and Veloutsou, 2017). Studies within the tourism sector highlight these platforms as authentic sources of primary data (Alaei *et al.*, 2019, pp. 175-177). According to Statista rankings (2024), Booking.com and TripAdvisor are among the most popular (Table 1).

The rapid spread of mobile applications and web platforms has significantly empowered Internet users, facilitating bidirectional communication in the travel and tourism sectors. This development has resulted in a substantial increase in online user-generated content (UGC) concerning hotels, destinations, and travel services (Sigala, 2008, p. 1341). Simultaneously, more travellers are leveraging the Internet for trip planning, consulting online reviews before making a purchase decision (Arica *et al.*, 2022, pp. 3-4; Boonsiritomachai and Sud-On, 2020, pp. 265-266).

**Table 1.** Most visited travel and tourism websites worldwide

Website	Description
<b>Booking.com</b>	Offers a broad range of travel services, including hotel bookings, flight searches, and car rentals, with a strong emphasis on pricing and availability.
<b>Tripadvisor</b>	Known for its extensive user-generated content, including reviews, photos, and recommendations for hotels, restaurants, and attractions.
<b>Airbnb</b>	Specializes in short-term rental accommodations, with a strong focus on unique stays and small-scale hospitality businesses.
<b>Trivago</b>	Focuses on hotel price comparison, enabling users to quickly find the best deals across multiple booking platforms.
<b>Minube</b>	Combines social networking with travel planning, offering personalized recommendations based on user preferences and experiences.

*Source:* Own work based on <https://iurban.es/most-popular-tourism-websites/?lang=en>.

According to Moliner-Velazquez *et al.* (2022, pp. 377-380), and Kościółek (2017, p. 59), online reviews are perceived by potential customers as being authentic, trustworthy, and helpful, thus influencing their market choices. From the perspective of hoteliers, reviews posted by former guests on online travel agents (OTAs) such as Booking.com or TripAdvisor significantly influence the hotel's image.

Positive reviews not only enhance the hotel's reputation but also allow for higher pricing strategies. Favourable feedback increases the hotel's popularity, boosts the likelihood of future bookings, and contributes to a greater market share (Boonsiritomachai and Sud-On, 2020; Belarmino and Koh, 2018, pp. 2730-2731).

Taking the above-mentioned effects for business into consideration, WOM (and eWOM) may be referred to as value co-creation, customers can contribute to the process by sharing their experiences. Arica *et al.* (2022, p. 1118) claim that the significance of tourists' engagement in the co-creation process can be understood through two primary outcomes, value co-creation and value co-destruction. Value co-creation refers to the collaborative effort and resource integration between businesses and their customers, resulting in mutual benefits for both parties involved (Lei *et al.*, 2021, p.1156).

Conversely, value co-distraction encompasses the intentional or inadvertent misallocation of resources during business-customer interactions, leading to adverse effects (Arica *et al.*, 2022, p. 1120). According to Järvi *et al.* (2020, p. 3), negative e-WOM behaviour can be caused by several experiences during a tourist process, i.e., lack of information, errors, an inability to service, an inability to adjust to customers' needs, a lack of clear expectations, customer misbehaviour, insufficient level of trust, etc.

Yet, it shall be stated that a communication negatively perceived by hoteliers (value co-destruction), may be beneficial for other customers, who can base their purchasing decisions and market behaviour on presented experiences and thus avoid or minimize dissatisfaction (Moliner-Velazquez *et al.*, 2022, pp. 379-381).

#### **4. Research Methods**

The purpose of the study was to evaluate the customers' inclination to share the online word-of-mouth in hotel sector. In the study two hypotheses were formulated:

*H1: Among the analysed factors affecting the probability of a positive reviews by guests, the high category of the accommodation establishment (number of stars) has a strong influence.*

*H2: National diversity influences sentiment variability.*

To accomplish the purpose of the paper, two methods were employed, i.e. the web scrapping method to collect data and natural language processing (NLP) to conduct sentiment analysis.

Information on accommodation establishments advertised in selected EU's cities was downloaded for 2021 and 2024 from Booking.com., which is the time scope of the study. Booking.com is one of the leading platforms for online accommodation reservations, operating globally in 43 languages and offering over 28 million options across 228 countries. Since its launch in 1996 the platform has facilitated more than a million bookings daily.

Leveraging its market expertise Booking.com provides competitive prices for a wide range of accommodations, including 5-star hotels, apartments, guesthouses, hostels, holiday homes, and Bed & Breakfasts. The platform's diverse listings and search options make it easy to find accommodations that meet specific needs, such as type, decor, bed configuration and amenities.

As regards tourism research, useful information is that obtained by means of web scraping. Using web scraping, a technique for automatic extraction of data from websites, one can obtain valuable information on tourism phenomena and processes. However, accessing this data is not straightforward as portal owners typically do not

provide it in a readily usable format. Manually collecting information is time-consuming but automated methods like web scraping can streamline the process.

Despite its efficiency web scraping can strain the portals being accessed. To mitigate this, many portals, such as Booking.com, have implemented advanced measures to prevent data extraction. These measures challenge most standard scraping tools and need to develop a custom solution capable of addressing key issues like:

- a. dynamic CSS (Cascading Style Sheets) selector definition,
- b. limiting the number of listings for specific locations,
- c. requiring additional user interactions to access certain data.

The most effective approach for overcoming these challenges is screen scraping, which simulates user interactions with the website. This technique not only mirrors typical user behaviour but also archives data for further processing and supports concurrent operations.

Therefore, the dataset used in this article was prepared using the screen scraping technique, considering data cleaning and data linking procedures, of course. In this article, 10 cities were selected – they were all located in the European Union countries (Table 2a) and showed the highest number of tourist nights spent in 2023 according to data provided by Eurostat.

The validity of this selection was confirmed by information published in other studies, such as Euromonitor's "Top 100 City Destinations Index 2023" (Table 2b), which also included these cities in its ranking.

**Table 2a.** List of the top 10 cities ranked by the number of nights spent at tourist accommodation establishments in 2023 (in m)

No.	City	Total
1.	Paris	75.5
2.	Rome	37.3
3.	Berlin	29.4
4.	Barcelona	28.3
5.	Madrid	25.3
6.	Amsterdam	21.4
7.	Lisbon	19.3
8.	Munich	18.6
9.	Prague	16.9
10.	Vienna	16.5

**Source:** Eurostat.

**Table 2b.** List of the top 10 cities ranked by the number of international visitors (in m)

No.	City	Total
1.	Istanbul	20.2
2.	London	18.8
3.	Antalya	16.1
4.	Paris	15.5
5.	Rome	10.3
6.	Barcelona	9.7
7.	Amsterdam	8.9
8.	Vienna	7.8
9.	Madrid	7.4
10.	Prague	7.1

**Source:** Euromonitor.

The dataset contained approximately 1 million records, including information such as the hotel's name, address, the reviewer's nationality, the review content and other information concerning accommodation quality. To ensure data consistency and quality, the dataset underwent appropriate preprocessing before conducting the analysis with special focus on sentiment analysis (Cierpiał-Wolan, WPJ Team, 2020).

Sentiment analysis is a popular process in Natural Language Processing, aiming at classifying the text based on the mood or mentality. Prior to the sentiment analysis, the dataset was subjected to several stages of cleaning. First, empty reviews and special characters were removed, and the text was converted to lowercase. Next, the dataset was restricted to reviews written exclusively in English by identifying the language of each review using the langdetect library.

The subsequent step involved the removal of non-informative words (known as stopwords) that do not carry significant informational value. Further, text processing included optional use of stemming and lemmatization, which are techniques for reducing words to their base forms.

However, it is worth noting that there is no definitive answer as to whether these steps are necessary in every case; therefore, two datasets were prepared—one with stemming and lemmatization applied and one without.

For sentiment analysis, the VADER model (Valence Aware Dictionary and Sentiment Reasoner) from the NLTK library was used. The VADER model was selected among several other models commonly used in text data analysis, as it is particularly recommended for analysing data from social media and online reviews.

Other models considered included Linguistic Inquiry Word Count (LIWC), General Inquirer (GI), Affective Norms for English Words (ANEW), SentiWordNet (SWN), SenticNet (SCN), and Word-Sense Disambiguation (WSD). VADER stands out for its ability to handle short texts typical of online reviews and considers the context of emotional polarity, making it particularly effective in this domain.

Although VADER performs well in sentiment analysis, it has its limitations. The model may not always accurately identify irony or sarcasm in the text, which can affect the quality of the analysis. However, in the context of hotel reviews, which often consist of short phrases, VADER remains an appropriate choice (Egger and Gorke, 2022, pp. 309-312; Sodhar an Buller, 2022, pp. 3-10; Jurafsky and Martin, 2024, pp. 40-43).

The VADER model assigns sentiment to reviews based on the vader\_score indicator: sentiment is considered positive for scores greater than 0.5, negative for scores less than -0.5, and neutral for scores in between. The nature of the dataset, with many

short and non-specific reviews, further highlights the advantages of the VADER model.

## 5. Research Findings

Based on data collected, a word cloud (also known as a tag cloud or text cloud) was created. It is a visual representation of text data where the size of each word indicates its frequency or importance within a given dataset. Words that appear more frequently in the text are displayed larger and more prominently, while less frequent words are smaller. The word cloud for positive and negative reviews scrapped on Booking.com is presented in Figure 1.

*Figure 1. The word cloud for positive and negative reviews scrapped on Booking.com*



*Source: Own work.*

Both word clouds have "hotel" and "room" as central terms, showing that these are key aspects of customer reviews. However, the left side emphasizes positive elements while the right focuses on negative aspects of hotels' offer. The positive word-of-mouth is presented in the left. Most prominent words were "hotel", "room", "staff", "great", and "location".

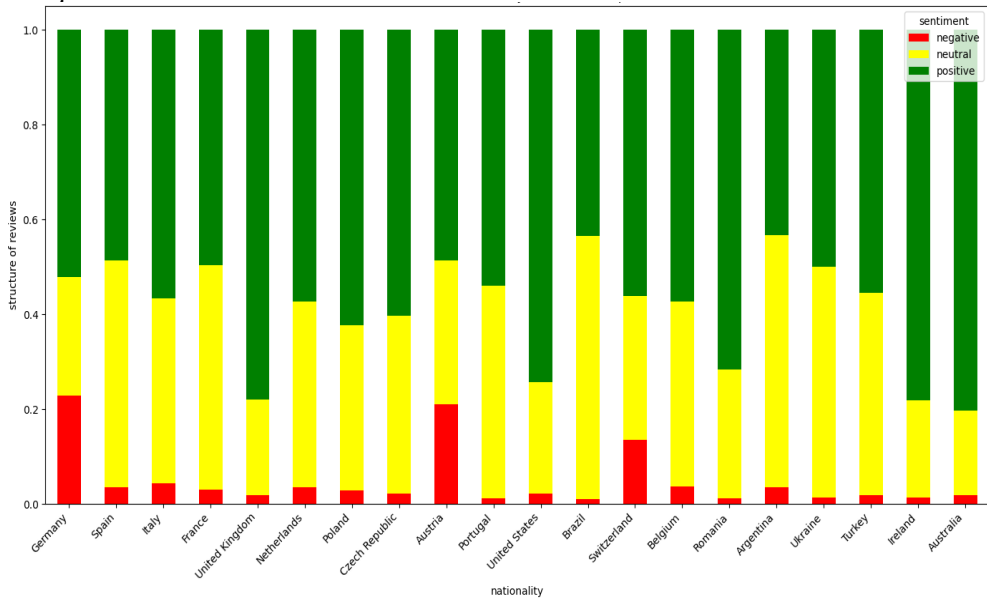
Positive aspects of the hotel experience are primarily centred around location and staff, indicating that people frequently mention a convenient location and friendly, helpful staff in their positive reviews. Words like "friendly," "helpful," and "comfortable" suggest satisfaction with customer service and the overall comfort of the hotel. Phrases such as "great location" and "positive" further emphasize that guests appreciated the convenience of the hotel's location and had overall positive experiences.

The right part of Figure 1 presents the negative review highlights. The most prominent words were: "hotel", "breakfast", "didn't", and "small", suggesting dissatisfaction with certain aspects of the hotel experience, particularly regarding expectations not being met. "Breakfast" and "room" are also large, possibly indicating that guests were unhappy with the quality of the breakfast or the size/condition of the room.

Words like "bathroom," "small," and "price" suggest issues related to the physical space (e.g., cramped rooms or bathrooms) or price concerns. Negative words like "expensive," "nothing," and "wasn't" highlight areas where the hotel failed to meet guest expectations.

The guests' opinions scrapped on Booking.com were then analysed based on the reviewers' nationality. The results are presented in Figure 2.

**Figure 2.** Structure of hotel guests' reviews by reviewer nationality for 10 selected European locations



**Source:** Own work.

The bar chart (Figure 2) visualizes the sentiment distribution of hotel reviews across different nationalities, with positive, neutral, and negative sentiments indicated by green, yellow, and red, respectively. The vertical axis shows the proportion of reviews per nationality, while the horizontal axis lists the nationalities.

High prevalence of positive reviews is observed across almost all nationalities, with the majority of reviews being overwhelmingly positive. Countries such as Germany, United Kingdom, United States, Romania, Ireland and Australia, show a strong majority of positive sentiment, indicating a general satisfaction with hotel experiences across these nationalities. Italy, Poland, Switzerland, and Belgium also show a high proportion of positive reviews, although slightly lower than the other countries mentioned above.

Neutral sentiment (presented in yellow) varies across nationalities. While most nationalities have a noticeable portion of neutral reviews, the proportion is relatively

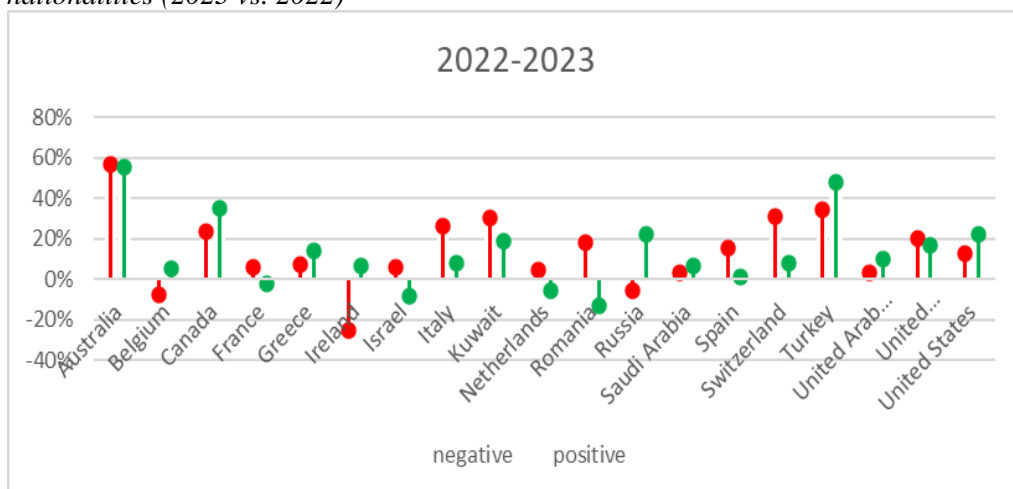
higher for Spain, France, Portugal, Brazil, Argentina, Ukraine and Turkey indicating more guests from these nationalities had mixed or indifferent experiences. United Kingdom, United States, Romania, Ireland and Australia show lower neutral sentiment, suggesting that guests from these countries are more likely to have clear positive or negative opinions rather than being neutral.

The lowest proportion of reviews falls into the negative sentiment category, but it still exists to some extent for all nationalities. Germany, Austria, and Switzerland show higher proportions of negative reviews compared to other nationalities, which could indicate some dissatisfaction with hotel experiences among these guests. United Kingdom, Portugal, Brazil, Romania, Ukraine, Turkey, Ireland, and Australia show very low levels of negative sentiment, indicating a minimal level of dissatisfaction among guests from these countries.

Generally, it may be observed that citizens from selected German-speaking countries, such as Germany, Austria and Switzerland tend to give the fewest positive reviews and the most negative ones. Similarly, English-speaking reviewers from Australia, the United Kingdom, United States, and Ireland exhibit similar behaviour, with a comparable distribution of positive reviews.

Mediterranean reviewers from Italy, France, and Spain show nearly identical patterns in their review structures. Not only the number of positive and negative reviews was a subject of our research interest, but the dynamics as well. The fluctuations of both positive and negative reviews by selected reviewer nationalities (2023 vs. 2022) is presented in Figure 3.

**Figure 3.** The dynamics of both positive and negative reviews by selected reviewer nationalities (2023 vs. 2022)



Source: Own work.



Figure 3 presents a comparative analysis of the changes in both positive and negative reviews across selected nationalities between 2022 and 2023. The findings reveal several notable trends in reviewer sentiment that reflect distinct shifts in perception across various countries.

Australia stands out as experiencing the most significant fluctuations, with an extraordinary increase in negative reviews, rising by approximately 60%, and a similarly large growth in positive reviews, exceeding 50%. This pronounced shift suggests heightened polarization in feedback during this period. A similar pattern, though on a smaller scale, is observable in Turkey, where both positive and negative reviews have increased considerably, indicating a potential dichotomy in public opinion or a divergent response to changing conditions.

Belgium and Canada also exhibit notable increases in negative reviews, with Canada showing a particularly marked rise of over 40%, while Belgium's negative reviews grew at a more moderate pace. In both countries, positive reviews have also increased, though not as dramatically, indicating a more balanced, yet still negative-leaning, overall sentiment shift.

In contrast, Ireland and the United Arab Emirates present a starkly different pattern, characterized by a substantial rise in positive reviews and a decline or minimal change in negative reviews. Ireland's positive reviews surged by approximately 30%, while negative reviews decreased by nearly 30%.

The UAE demonstrates the most dramatic increase in positive reviews, with growth nearing 60%, suggesting an overall improvement in sentiment towards products or services associated with this nationality. These findings indicate an increasingly positive perception, in contrast to other countries where negative reviews predominate.

Certain countries, such as Israel and Romania, exhibit relatively stable trends, with minimal change in both positive and negative reviews, suggesting consistency in public opinion across the two years. In contrast, Russia shows a clear rise in negative reviews, accompanied by a slight decline in positive reviews, pointing to a growing discontent in this region.

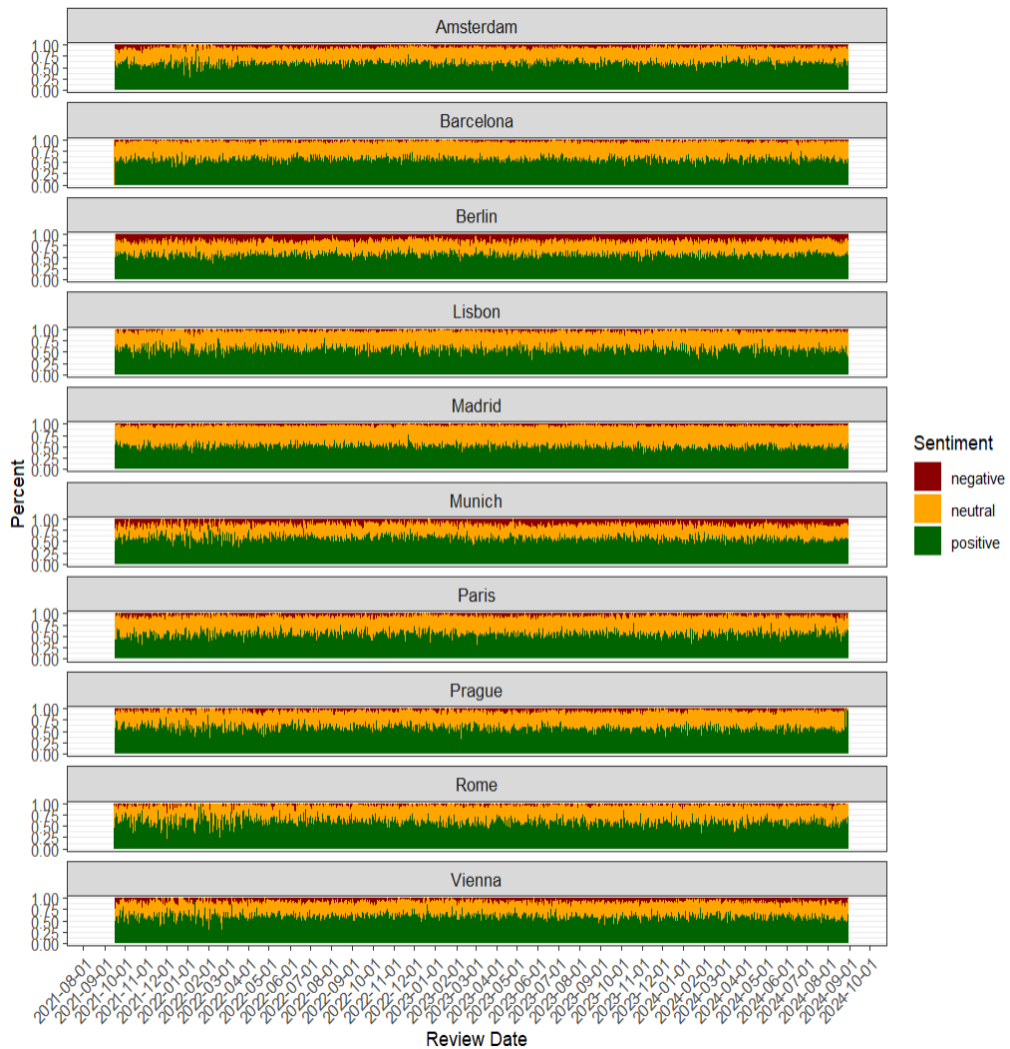
Finally, the United States and the United Kingdom display more moderate shifts in reviewer sentiment. Both countries show small increases in both positive and negative reviews, suggesting that while perceptions may have evolved, they remain relatively balanced.

Overall, the data highlight significant variations in sentiment across nationalities, with some countries, particularly Australia, Turkey, and Canada, experiencing notable increases in negative reviews. In contrast, other nations, such as the United Arab Emirates and Ireland, demonstrate strong positive sentiment. These dynamics

may reflect broader socio-economic, political, or cultural factors that shaped public opinion and attitudes during the period under review.

In the research process, cities with the highest percentage of reviews were identified. The results are shown in Figure 4.

**Figure 4.** Review Structure for 10 European Locations (2021-2023).



**Source:** Own work.

The provided Figure 4 offers a temporal analysis of sentiment distribution across multiple cities, including Amsterdam, Barcelona, Berlin, Lisbon, Madrid, Munich, Paris, Prague, Rome, and Vienna, from August 2021 to August 2023. Sentiment is categorized into three distinct groups, positive (green), neutral (yellow), and negative (red), measured as a percentage of total reviews over time.

It may be observed that across all cities, the majority of the reviews are positive, as evidenced by the substantial proportion of green in each city's timeline. This is particularly pronounced in cities like Rome, Paris, and Berlin, where the green sentiment layer remains consistently robust throughout the two-year period. The overall stability of positive reviews may suggest a generally favourable perception of services or experiences within these urban areas, sustained over time without significant fluctuations.

The proportion of neutral sentiment (yellow) is relatively stable and consistent across all cities, occupying a smaller share of the review percentages. While neutral sentiment appears less dominant compared to positive sentiment, it constitutes a notable portion of the overall distribution in certain cities, such as Madrid and Vienna, where the yellow layer is slightly more pronounced. This suggests that a significant portion of reviewers remain ambivalent or provide feedback that lacks clear emotional polarity, likely reflecting mixed or average experiences.

Negative sentiment (red) remains the smallest proportion across all cities, indicating that dissatisfied reviews constitute a minor percentage of the overall feedback. Notably, Munich and Lisbon exhibit slightly higher percentages of negative reviews compared to other cities, where the red layer appears more visible. This could imply specific challenges or events within these locations that may have led to a relatively higher frequency of negative experiences.

The sentiment trends across most cities appear relatively stable over time, with no pronounced peaks or troughs that indicate sudden shifts in public perception. The consistency of positive sentiment is particularly striking, suggesting that the overall experience in these cities has remained largely favourable over the observed period. However, there are minor fluctuations in neutral and negative sentiment across all cities, though none seem to indicate a major trend reversal or significant event affecting overall sentiment.

While all cities exhibit a predominance of positive sentiment, some variations exist. For example, Prague and Vienna show slightly more balanced sentiment distributions, with a visible proportion of neutral and negative reviews. In contrast, Barcelona and Rome show fewer negative reviews and a more dominant positive sentiment throughout, indicating potentially better overall reception in these cities. This may reflect local factors, such as cultural, economic, or service-related differences that influence customer satisfaction differently across cities.

To investigate the relationship between reviews by guests of accommodation establishments and selected information about accommodations, both logistic and probit models were employed. The dependent variable is the reviews of the accommodation (0-negative, 1-positive). The same independent variables were used in both models: the number of stars awarded to the accommodation {0,1,2,3,4,5},

the rating of the accommodation from Booking.com {1,2,3,4,5,6,7,8,9,10}, distance from the city centre (km), and a sustainable development certificate (0-no, 1-yes).

The analysed parameters for evaluating the quality of the logit model (pseudo-R<sup>2</sup>, R<sup>2</sup>-count, AUC, Gini coefficient, likelihood ratio test, C-Value, Kendall's tau-a, Brier score) as well as the probit model (pseudo-R<sup>2</sup>, R<sup>2</sup>-count, AUC, likelihood ratio test) indicate good predictive properties for both models (Table 3).

**Table 3.** *Logit and Probit models*

<b>Specification</b>	Logit			Probit		
	Coef.	(S.E.)	signif.	Coef.	(S.E.)	signif.
<b>Number of stars</b>	0.0652	(0.0031)	***	0.0330	(0.0016)	***
<b>Rating of accommodation</b>	0.2977	(0.0104)	***	0.1528	(0.0055)	***
<b>Distance from the city centre</b>	-0.1221	(0.0027)	***	-0.0657	(0.0015)	***
<b>Sustainability certification</b>	0.2692	(0.0139)	***	0,1511	(0.0072)	***

*Source:* Own work.

Table 3 provides results from Logit and Probit models, showing the coefficients (Coef.), standard errors (S.E.), and significance levels (denoted by "\*\*\*\*" for high statistical significance) for four different independent variables. The coefficients of the model indicate a positive relationship between reviews and selected information about the accommodations.

Only the variable distance from the centre indicates an opposite tendency. It is also worth noting that highest probability (for the logit model the logarithm of the odds) of a positive review is associated with the rating of the accommodation from Booking.com and a sustainable development certificate. In contrast, the number of stars has the weakest impact.

## 6. Discussion

The findings of the study highlight the pivotal role of eWOM in influencing consumer behaviour and business outcomes in the hotel industry. Positive eWOM, particularly when linked to high hotel ratings, strategic location, and sustainability certifications, has a significant impact on customer decisions, reinforcing the importance of these factors for hotel managers.

These results align with previous studies suggesting that customer-generated content is often perceived as more authentic and trustworthy compared to traditional marketing efforts, thereby exerting a stronger influence on potential guests.

A key discussion point revolves around the influence of sustainability certifications on eWOM. Hotels with such certifications not only benefit from a positive brand image but also attract customers who value environmental responsibility,

contributing to a favourable eWOM cycle. This is increasingly relevant in a market where sustainability is gaining importance among consumers.

Additionally, the study reveals that proximity to city centres remains a crucial factor for positive reviews, as it enhances convenience for guests, thus contributing to overall satisfaction.

The analysis also shows that guest satisfaction often leads to positive eWOM. In cases where customer expectations are not met, negative eWOM spreads quickly and can damage a hotel's reputation. This underscores the need for effective reputation management and responsive customer service to mitigate negative feedback.

## **7. Conclusions**

The study underscores the increasing importance of eWOM in the hotel industry, particularly as more consumers rely on online reviews to make informed booking decisions. In an era where digital platforms dominate consumer interaction, eWOM has emerged as a powerful tool for shaping business outcomes. Positive eWOM enhances a hotel's reputation and drives bookings, while negative reviews can quickly damage brand perception.

Given the influence of customer-generated content, it is crucial for hotel managers to understand the key factors that drive positive and negative eWOM and to develop strategies that foster positive customer experiences.

1. Impact of eWOM on Consumer Behaviour: eWOM significantly influences hotel booking decisions, with positive reviews enhancing customer trust and increasing the likelihood of bookings, while negative reviews can deter potential guests.
2. Importance of Hotel Attributes: Star ratings, proximity to city centres, and sustainability certifications are key drivers of positive eWOM. Hotels should prioritize these areas to improve customer satisfaction and attract positive online reviews.
3. Based on the logit and probit model, it turned out that the high category of the accommodation establishment (number of stars) does not strongly affect the probability of a positive review compared to the other factors (the rating of the accommodation from Booking.com, distance from the city centre, and a sustainable development certificate. Thus, the first hypothesis was negatively verified.
4. Detailed analysis of the data shows a clear clustering of similar reviews for citizens from selected German-speaking and English-speaking guests as well as Mediterranean reviewers. Therefore, the second hypothesis has been positively verified.

5. Sustainability as a Growing Trend: Sustainability certifications not only improve a hotel's image but also resonate with environmentally-conscious customers, contributing to positive eWOM and customer loyalty.
6. Challenges of Negative eWOM: Negative reviews can have a damaging impact on a hotel's reputation, emphasizing the need for effective reputation management strategies and quick responses to customer dissatisfaction.
7. Future Directions: Further research should explore how emerging technologies, such as AI-driven reviews and personalized customer interactions, could be leveraged to enhance eWOM management and customer satisfaction.

These conclusions provide valuable insights for hotel managers seeking to improve their service offerings and better navigate the digital landscape where customer-generated content plays a central role in shaping business outcomes.

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