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The effect of social media sentiment on Instagram check-in activity in the hospitality industry: A case study of 5-star hotels in Mashhad

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Abstract

Social media has become a vital communication channel in various industries, including tourism and hospitality. This study aims to investigate the impact of social media—specifically user-generated content—on the occupancy rates of 5-star hotels in Mashhad, Iran. The research follows a three-stage methodology. First, customer reviews from Instagram fan pages of selected hotels were collected using the Graph API Explorer and analyzed through sentiment analysis to classify them into positive, negative, or neutral categories. Second, hotel occupancy was estimated using the number of weekly check-ins on Instagram as a proxy due to restricted access to official occupancy data. Finally, regression analysis was applied to examine the relationship between the percentage of positive reviews and the number of check-ins. The results reveal a strong positive correlation between favorable customer comments and hotel check-ins for most of the studied hotels, suggesting that social media plays a critical role in influencing consumer decision-making and hotel occupancy. The findings emphasize the strategic importance of leveraging social media platforms for effective marketing and customer engagement in the hospitality industry.

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Introduction

Mashhad, a prominent religious destination in Iran, has long attracted millions of pilgrims and religious tourists from across the country and other Islamic nations due to its rich cultural and spiritual heritage. Despite global economic challenges and political constraints in Iran, the number of foreign tourists visiting Mashhad exceeded 3 million in 2023 (Mashhad Municipality Statistics, 2023–2024). In this highly competitive hospitality market, hotel operators must explore effective strategies to attract new guests and foster customer loyalty.

In recent years, social media has significantly transformed how travelers plan their trips and choose accommodations. Platforms such as Instagram, Facebook, and Twitter now serve over 2 billion users daily (Instagram Help Center, 2020), offering an influential source of information for prospective travelers. Modern tourists increasingly rely on social media to gather insights, compare destinations, and make informed decisions about hotels and amenities (McCarthy et al., 2012). Consequently, establishing a strong presence on social media has become essential for hotels seeking to engage with customers and enhance their visibility.

This study focuses on 5-star hotels in Mashhad, which are known for delivering high-quality services and maintaining premium hospitality standards. Their strategic locations—particularly those near the shrine of Imam Reza (AS)—make them attractive to religious tourists. However, some of these hotels may underestimate the potential of social media as a powerful marketing channel, given their established reputations and prime locations. To address this gap, the current research proposes a method for analyzing the impact of social media engagement on hotel occupancy rates.

To evaluate this impact, the study tracks positive customer comments posted on the Instagram pages of selected 5-star hotels over a three-month period, as well as the number of user check-ins at these locations. Instagram's check-in feature allows users to tag their current location using GPS, publicly sharing their presence at specific venues. Although this metric does not represent exact occupancy figures—especially for hotels located near public areas or shared facilities—it provides a useful proxy for estimating visitor interest.

To ensure reliability, the research focuses on hotels that meet the following criteria: (1) they operate an official Instagram page with the check-in feature enabled, and (2) they are situated in private locations without adjacent businesses that could distort check-in counts. Based on these criteria, four hotels were selected for detailed analysis: Majalal Darvishi, Qasr Talaei (Golden Plus), Khorshid Hastom Kowsar, and Homay Hotel No. 2. The methodological framework used in this study is presented in the subsequent sections following a review of relevant literature.

A sample of guest comments is presented in Figure 1.



Figure 1. A sample of customer comments posted on the hotel's Instagram fan page

Background/ literature Review

Over the past few decades, the rise of social media has significantly transformed customer behavior, shifting interactions from traditional face-to-face communication to digital and electronic engagement. Among the most impactful developments is the emergence of electronic word of mouth (eWOM), which has become a key source of information influencing consumer purchasing decisions, (McCarthy et al., 2012).

In the hospitality, hotel, and tourism sectors, eWOM has received considerable academic attention. For instance, Litvin et al. (2022) emphasized the effectiveness of online interpersonal influence as a strategic marketing tool within tourism and hotel management. Following this, numerous researchers explored various dimensions of social media in hospitality. Xiang and Gretzel (2020) examined how travelers use social media for travel-related information searches, simulating search engine behavior during trip planning. Their findings highlighted the growing significance of social media in digital tourism ecosystems.

Furthermore, studies increasingly suggest that social media may soon rival, or even replace, traditional marketing channels. Mangold and Faulds (2009) introduced a hybrid marketing model that integrates websites, blogs, and social media platforms to enhance customer engagement. Building on this, Leung et al. (2018) compared the marketing effectiveness of Instagram, Twitter, and Facebook in the hospitality sector. Their study found that guests' shared experiences on these platforms significantly shape their perceptions of hotel brands, emphasizing the need for consistent messaging across all official social media channels.

In parallel with the growth of social media, sentiment analysis—also referred to as opinion mining—has gained popularity as a tool to assess customer attitudes and satisfaction. Widely applied across multiple industries, including tourism and hospitality, this technique enables businesses to extract meaningful insights from large volumes of user-generated content.

Several comparative studies have explored sentiment analysis methods and tools. For example, Cheng and Zhang (2021) reviewed major techniques in document-level sentiment classification and

opinion extraction, offering a foundational understanding of the field. Similarly, Serrano-Guerrero et al. (2015) conducted a comparative evaluation of open-access web services for sentiment analysis, focusing on their effectiveness in scoring and categorizing user opinions.

Beyond theoretical frameworks, practical applications of sentiment analysis in social media environments have been widely documented (Pugsee et al., 2020; Dangn et al., 2010; Siersdorfer et al., 2014; Momeni et al., 2023). Research by Pugsee (2020) analyzed customer feedback on airline services using a decision tree model. The study demonstrated that travelers' online opinions significantly affect their choices of accommodation and dining options. This trend underscores the importance for hospitality brands to actively cultivate positive online reviews to enhance customer acquisition and loyalty.

Taken together, these studies underscore the transformative role of social media and sentiment analysis in shaping consumer behavior. For the hospitality industry, leveraging social media analytics offers valuable opportunities to monitor customer feedback, evaluate brand reputation, and implement data-driven marketing strategies. As such, social media should be regarded not merely as a communication platform, but as a powerful business intelligence tool.

Methodology

This study adopts a quantitative approach, focusing on user-generated content from social media platforms and examining the correlation between hotel occupancy rates and positive user feedback. The research is derived from a broader applied research project aimed at developing a hospitality model for religious tourism, using the city of Mashhad as a case study. Within that project, various dimensions of hospitality were identified and analyzed, with social media platforms considered as influential variables in shaping tourists' perceptions and satisfaction. The theoretical foundation of this article is directly based on that project. Additionally, a segment of the empirical data used in this study was independently collected during the course of the aforementioned research. Instagram, recognized as one of the most impactful social media platforms in the tourism sector, was selected as the primary data source.

User comments were extracted from fan pages of several five-star hotels in Mashhad and were categorized into three sentiment groups: positive, negative, and neutral, using sentiment analysis techniques. Simultaneously, the number of check-ins recorded on the hotels' Instagram pages was used as a proxy indicator of hotel occupancy rates. Regression analysis was then employed to evaluate the relationship between the number of positive comments and customer visits. This article builds upon the conceptual framework of the original project by specifically focusing on the role of social media—Instagram in particular—as a modern tool that influences tourist behavior and decision-making processes in hotel selection.

This study employs a three-stage methodological framework to examine the influence of social media on hotel occupancy rates:

1. Collection and analysis of guest reviews from social media
2. Estimation of hotel occupancy rates
3. Examination of the relationship between positive reviews and check-in data

In the first stage, user-generated comments were collected from the official Instagram pages of selected hotels using the Graph API Explorer, a data retrieval tool developed by Facebook and Instagram. These comments were subsequently analyzed using sentiment analysis tools such as SPSS, Microsoft Excel, and specialized Sentiment Analysis Add-ins. The collected data were categorized into positive, negative, or neutral sentiments based on the polarity of the language used.

Given the restricted access to official occupancy figures, this study used the number of Instagram check-ins as a proxy measure of hotel occupancy. Instagram's "Check-in" feature enables users to tag their geographic location, making it a publicly available indicator of visitor presence. However, to enhance the reliability of this proxy, only hotels that met two criteria were included in the analysis:

- 1) They had an active Instagram page with the check-in feature enabled, and
- 2) They were situated in private locations, isolated from surrounding businesses that might otherwise inflate check-in numbers.

Based on these criteria, four 5-star hotels in Mashhad were selected as case studies: Darvishi Hotel, Ghasr Talae (Golden Palace), Khorshid Hashtom Kowsar, and Homa Hotel No. 2.

Findings

In the first stage of data collection, customer reviews posted on the Instagram fan pages of selected 5-star hotels in Mashhad were automatically retrieved using the Graph API Explorer—a tool developed by Facebook and Instagram that enables users to access and extract public data from their platforms. This process yielded a dataset comprising guest comments and feedback related to their hotel experiences. These collected reviews formed the basis for subsequent sentiment analysis. A sample of the extracted reviews is illustrated in Figure 3.

The collected Instagram comments were subsequently analyzed using sentiment and opinion analysis techniques. Sentiment analysis, also referred to as opinion mining, is a widely adopted method for assessing customer attitudes, levels of satisfaction, and overall emotional tone in textual data (Siersdorfer et al., 2014). In this study, sentiment classification was performed using a combination of analytical tools, including the Sentiment Analysis and Text Analytics Add-in, SPSS, and Microsoft Excel. These tools are designed to identify polar words—terms that express subjective opinions, emotions, or attitudes.

Based on the presence of such polar words, each review was classified as either positive or negative. Comments that lacked any sentiment-bearing language were categorized as neutral. An example of this sentiment classification process is presented in Table 2.

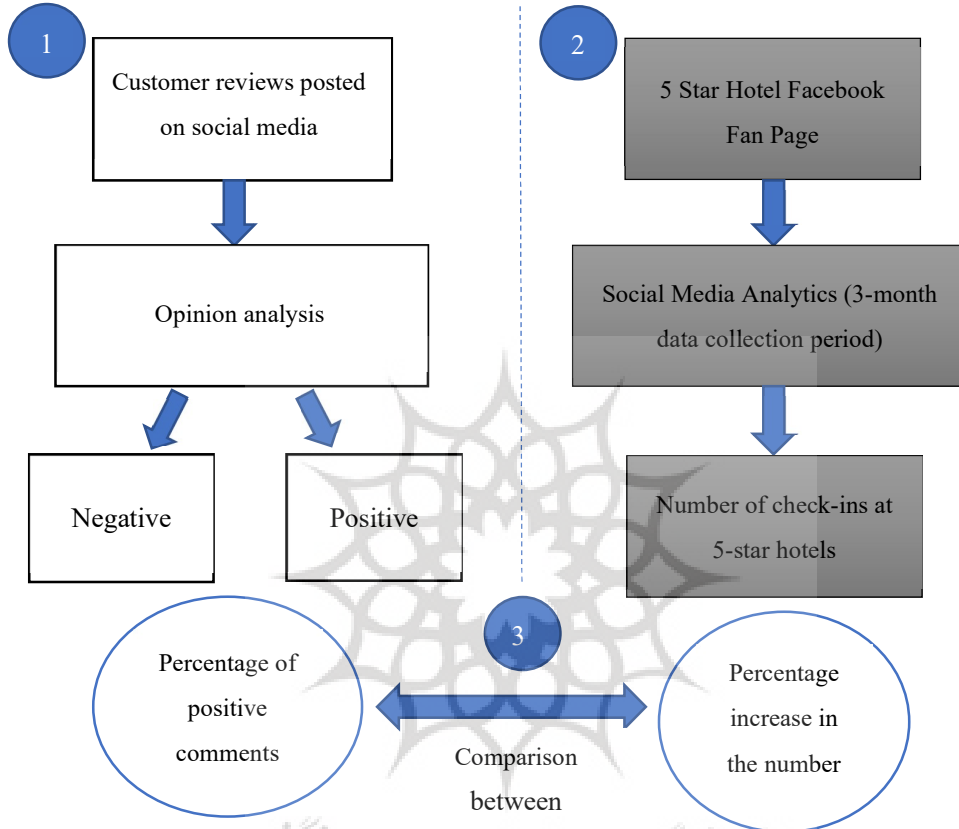


Figure 2. Research process flowchart

Table 1. List of collected customer reviews

Very big hotel! Clean and comfortable, the staff here speaks very good English and Arabic!
Friendly and trained staff. Nice and cozy hotel.
Very good place to relax and visit.
Fast food and also pizza is not good.
Very beautiful! Excellent service and atmosphere. I am already looking forward to my next stay. My little boy and I had the most wonderful moments. Thank you for the three enjoyable days and for all the hospitality.
Amazing stay. Can't wait to come back!! Very impressive
this week. Traveling to the holy Mashhad, staying in this hotel has a very good atmosphere and I will definitely come back again. Very soon (I already planned it for the end of this month.)

Table 2. Example of sentiment analysis

Date compiled	Customer reviews	Analysis
July 28, 2023	Good hotel. Good service. Great view. Great hotel manager	Positive
August 4, 2023	Price too high	Negative
August 24, 2023	Always impressed with your best service. Will see you again this weekend	Positive
September 2, 2023	Can't fault the amazing time I had, the staff are very polite and helpful and the food is amazing.	Positive
September 7, 2023	It would actually be nice if the renovation wasn't in full swing. Was asleep since 8.30am not thinking anymore. The entrance to the hotel is a monstrous construction site. Just not good for a quiet holiday. The staff try hard but have nothing against the extreme noise pollution	Negative

Estimating Hotel Occupancy by Monitoring Instagram Check-ins

In this second phase, the number of check-ins displayed on each hotel's Instagram fan page was tracked and collected over a three-month period to analyze occupancy trends. The data was gathered using Instagram's Graph API Explorer, a tool provided by Instagram Developers for accessing such metrics. Figure 3 illustrates an example of how the Graph API Explorer was used to retrieve the number of check-ins from the Instagram fan page of the Homay Hotel in Mashhad. In this study, the occupancy rate for each hotel was approximated based on the weekly check-in counts recorded over the three months. The outcome of this step is a numerical representation of check-ins on the Instagram fan page, with sample data presented in Table 3.

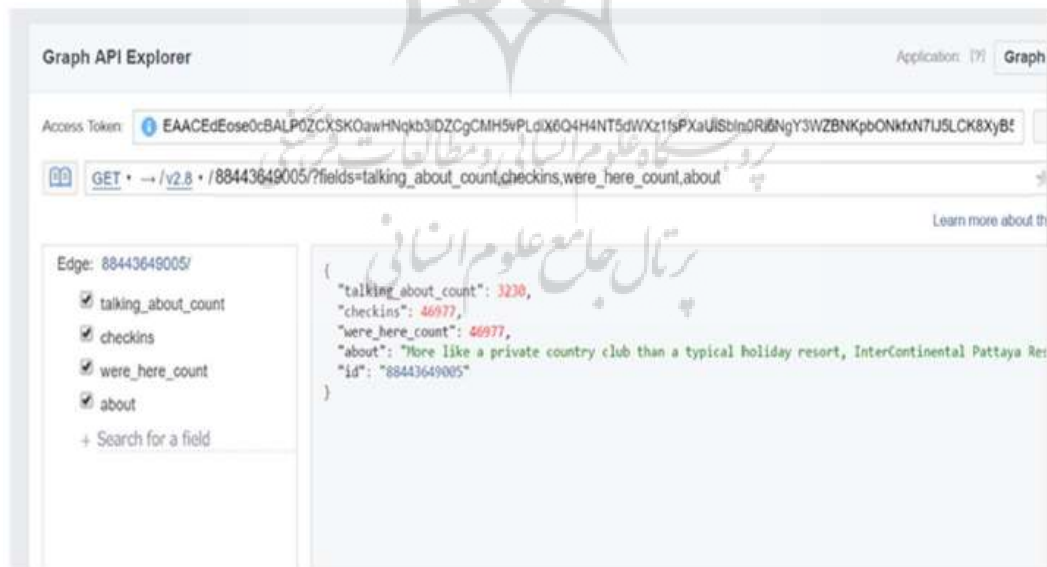
**Figure 3. Using Graph API Explorer to collect the number of check-ins**

Table 3. Number of check-ins collected on the hotel's fan page on Instagram

Week number	Data collection date	Number of check-ins on the FB page
1	5 Aug 23	42623
2	12 Aug 23	43187
3	19 Aug 23	43690
4	26 Aug 23	43847
5	2 Sep 23	44234
6	9 Sep 23	44614
7	16 Sep 23	44815
8	23 Sep 23	45078
9	30 Sep 23	45579
10	7 Oct 23	45914
11	14 Oct 23	46045
12	21 Oct 23	46363
13	28 Oct 23	42623

The Impact of Social Media on Hotel Occupancy

To investigate the effect of positive comments posted on Instagram on the number of visits to the hotel's Instagram page—which serves as an indicator of hotel occupancy—this study employed linear regression analysis to assess the relationship between these two variables. Linear regression is a fundamental and widely used predictive technique that not only explains the relationship between a dependent and an independent variable but also quantifies the strength of the independent variable's influence on the dependent variable. Regression analysis is commonly used in hospitality research to explore factors affecting hotel performance, such as pricing, guest satisfaction, and occupancy rates (Mattila & O'Neill, 2003). Similarly, in the restaurant industry, regression has been applied to examine how quality dimensions—including food, service, and physical environment—impact customer satisfaction and behavioral intentions in limited-service restaurants (Ryu et al., 2022). Accordingly, in this study, the percentage of positive reviews for each hotel was treated as the independent variable (X), while the number of Instagram check-ins was set as the dependent variable (Y). The results of the linear regression analysis, conducted using SPSS, will be presented in the following section. Additionally, a scatterplot was utilized as an initial data visualization tool to explore the potential relationship between these variables, as illustrated in Figure 4.

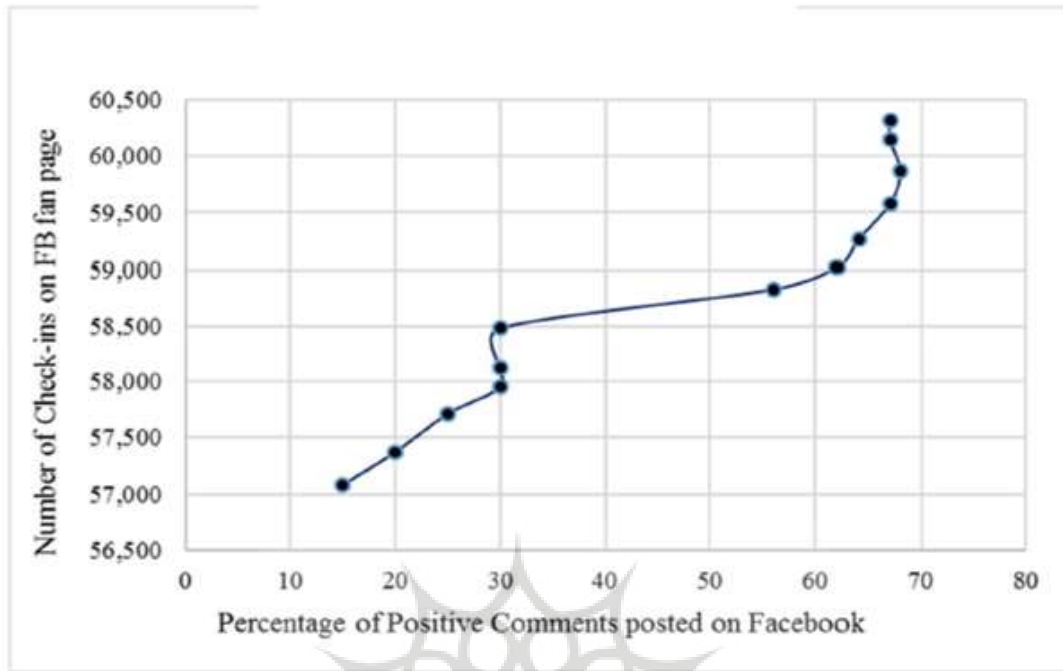


Figure 4. An example of a scatterplot showing the relationship between two variables (Darvishi Luxury Hotel)

Results

According to the proposed method in this study, the comments collected in the first stage were categorized into two groups—positive and negative—using opinion analysis techniques. Consequently, the percentage of positive comments posted on each hotel’s Instagram page is presented in Table 4.

As shown in Table 4, four five-star hotels in Mashhad were selected for review over a three-month period: Majalal Darvishi, Qasr Talaei (Golden Plus), Khorshid Hastom Kowsar, and Hoday Hotel No. 2. If the majority of customer reviews for each hotel are positive, the data obtained at this stage can provide valuable insights for hotel management regarding customer feedback and guest satisfaction assessment. Conversely, if most comments are negative, hotel management should promptly take action to improve their services. Following this, the second phase involved using the Graph API Explorer to collect Instagram page data over the same three-month period, with results presented in Table 5. These data offer hotels an overview of customer visits, serving as an indicator of occupancy and popularity on social media. Additionally, social media analytics tools like the Graph API Explorer enable hotels to benchmark their performance against competitors based on the number of customer visits recorded on their Instagram fan pages. Finally, a linear regression analysis was conducted to investigate the

relationship between the volume of positive customer comments and the number of check-ins on each hotel's Instagram page.

Table 4. Percentage of positive comments posted on hotels' Instagram pages

Percentage of positive customer comments posted on the hotel's FB page					
Week number	Data collection date	Ghasr talaei (Golden Plus)	Majleel Dervish	Homay 2	Khorshid 8th Kowsar
1	5 Aug 23	15	50	100	80
2	12 Aug 23	20	67	100	82
3	19 Aug 23	25	67	100	83
4	26 Aug 23	30	67	100	83
5	2 Sep 23	30	75	100	84
6	9 Sep 23	30	60	100	84
7	16 Sep 23	56	67	80	77
8	23 Sep 23	62	78	74	77
9	30 Sep 23	64	80	76	78
10	7 Oct 23	67	79	75	80
11	14 Oct 23	68	81	75	81
12	21 Oct 23	67	83	83	81
13	28 Oct 23	67	83	76	82

The analysis was conducted with positive comments posted on Instagram as the independent variable and the number of check-ins on the hotel's Instagram fan page as the dependent variable. The results of the regression analysis are presented in Table 5.

$P \leq .001$ ***

As shown in Table 5, the correlation coefficients for Darvishi Luxury Hotel, Qasr-e-Talaei Hotel (Golden Plus), and Homay Hotel No. 2 indicate a strong positive relationship between positive comments and the number of Instagram check-ins (with R values close to +1 and $p < .001$). In contrast, the relationship for Khorshid-e-Hastom Kowsar Hotel was not statistically significant ($p = .378$), likely due to its substantially lower number of check-ins compared to the other three hotels. Therefore, in this case study, positive customer comments for the newly opened Khorshid-e-Hastom Kowsar Hotel do not appear to be linked to the number of social media check-ins.

Table 5. Number of check-ins collected on hotels' Instagram pages

Number of check-ins on hotels' FB pages					
Week number	Data collection date	Ghasr talaei (Golden Plus)	Majleel Dervish	Homay 2	Khorshid 8th Kowsar
1	5 Aug 23	57083	42623	71869	13772
2	12 Aug 23	57375	43187	72519	14004
3	19 Aug 23	577714	43690	۷۳۹۰۰	14225
4	26 Aug 23	57948	43847	74429	14468
5	2 Sep 23	58119	44234	75112	14712
6	9 Sep 23	58488	44614	75997	14863
7	16 Sep 23	588831	44815	76718	15009
8	23 Sep 23	59021	45078	77340	15167
9	30 Sep 23	59267	45579	77608	15304
10	7 Oct 23	59584	45914	78594	15441
11	14 Oct 23	59870	46045	79459	15568
12	21 Oct 23	60148	46363	79794	15687
13	28 Oct 23	60324	46661	80265	15723

Table 6. Regression coefficients for the number of check-ins

Hotel name	R	Sig.
Ghasr talaei (Golden Plus)	0.841	0.000
Homay 2	0.945	0.000
Khorshid 8th Kowsar	0.867	0.000
Majleel Dervish	0.267	0.378

Discussion & Conclusion

This study highlights the growing significance of social media in shaping consumer behavior within the hospitality industry. By analyzing the relationship between positive customer reviews posted on Instagram and the number of check-ins reported on hotel Instagram pages, the findings demonstrate a strong positive correlation—except in the case of Khorshid Hashtom Kowsar Hotel, which had recently opened and may not yet have established a strong social media presence.

The results suggest that user-generated content, particularly positive feedback, can play a critical role in influencing potential guests' decisions and ultimately enhancing hotel occupancy rates. Therefore, hotels should actively encourage guests to share their experiences on social media platforms, as these endorsements serve as modern word-of-mouth marketing.

Moreover, the findings reinforce the notion that maintaining a consistent and engaging social media strategy is not merely beneficial but essential in today's competitive hospitality landscape. Hotels that invest in cultivating a strong online reputation can gain a distinct competitive advantage.

In conclusion, this study provides practical insights for hotel managers and marketers, emphasizing the importance of integrating social media engagement into broader customer relationship and marketing strategies. Positive sentiment shared online not only boosts visibility but also has the potential to directly impact occupancy and brand perception.

limitations/recommendation for future studies

Problems and limitations of the research include: 1- Difficult cooperation of hotels in the field of research. 2- Difficult access to information. 3- Lack of direct access to hotel guests. 4- The problem of Internet filtering. 5- Differences in hotel services and facilities and their impact on guests' opinions. 6- Instagram check-ins reflect social engagement and influence, but they do not directly correspond to actual bookings or hotel stays.

Research suggestion for the future: Investigating the employment pattern in the hospitality industry by focusing on small and medium-sized enterprises in this industry and comparing the role of large economic enterprises versus small and medium-sized enterprises in order to influence the development of employment in the tourism and hospitality industry. Several factors—such as discounts, actual hotel capacity, service quality, travel season, and offline advertising—can affect both occupancy rates and online user behavior. Although these variables were beyond the scope of this study, they are acknowledged as limitations in the discussion section, along with recommendations for future research.

Author Contribution

M. Rahimi Khosh conducted the literature review, research design, data analysis and interpretation, manuscript writing, and final editing. Dr. Jafar Ahangaran, as the supervisor, oversaw the research process, provided scientific guidance in data interpretation, and critically revised the final manuscript.

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Conflict of Interest

The authors declare that there is no potential conflict of interest regarding the publication of this paper. All ethical principles, including academic integrity, data accuracy, informed consent, and avoidance of plagiarism or duplicate publication, have been fully observed.

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