UNEC Journal of Computer Science and Digital Technologies
Volume 2, № 1, 2026, pp. 66-75
https://doi.org/10.30546/UNECCSDT.2026.001.256

Section:
Digital Transformation and Emerging Technologies

ESG Indicators and Online Reputation in Tourism Platforms: A Pilot Data Analysis

Nijat Safarov
University of Economics in Katowice, Katowice, Poland
0009-0001-0550-6874, nijat.safarov@edu.uekat.pl

Abstract

This paper investigates whether sustainability performance, measured through environmental, social, and governance (ESG) indicators, is reflected in digital reputation signals on tourism platforms at the city level. Destination managers and public institutions increasingly rely on ESG-based metrics to evaluate sustainability. However, reputation systems on digital tourism platforms—such as ratings, reviews, and rankings—remain largely driven by perceived service quality and popularity. This disconnect may reduce transparency and limit the ability of platform-based demand to support sustainable destination governance. Using a pilot empirical design, the study links publicly available ESG indicators for fifteen tourism cities with platform-based reputation measures derived from attraction ratings and review volumes on TripAdvisor. The analysis examines relationships between ESG indicators and digital reputation signals, as well as differences across ESG dimensions and between evaluative indicators (average ratings) and visibility indicators (review volume). The results show that environmental and social indicators are modestly associated with perceived destination quality, while governance indicators are more strongly related to platform visibility. These findings provide preliminary empirical evidence on the ESG–reputation relationship and highlight the potential relevance of integrating sustainability indicators into digital tourism reputation systems.

Keywords: ESG indicators; tourism cities; online reputation; digital tourism platforms; sustainable destination governance

Received:	*Revised:*	*Accepted:*	*Published:*
20/05/2026	*01/06/2026*	*07/06/2026*	*17/06/2026*

1. Introduction

The emergence of digital tourism platforms has significantly transformed destination visibility and tourist decision-making processes. Reputation systems embedded in these platforms, such as ratings, reviews, and algorithmic rankings—function as key signals of quality and trust, influencing destination competitiveness and market outcomes in global tourism markets [1–3]. Although these mechanisms were originally designed to support engagement optimization and commercial performance, they increasingly operate as informal governance structures that shape how destinations are perceived and selected within digital tourism ecosystems [4].

At the same time, sustainability and responsible tourism development have become central priorities in destination management and public policy. Environmental, social, and governance (ESG) indicators are widely used by governments, international organizations, and institutional stakeholders to assess long-term sustainability performance and guide tourism development strategies [5–7]. These sustainability metrics aim to integrate tourism growth with

environmental protection, social well-being, and effective governance practices. Recent research also emphasizes the growing importance of digital development processes and risk-oriented approaches in shaping contemporary digital ecosystems and governance environments [26, 27].

Despite this growing institutional emphasis on sustainability, ESG-based evaluations remain largely disconnected from the user-facing reputation systems embedded in digital tourism platforms. While platform reputation systems primarily reflect popularity and perceived service quality, they rarely capture broader environmental and social impacts associated with tourism activity [2, 8]. This disconnect creates a gap between institutional sustainability assessment and platform-mediated reputation formation.

To address this gap, the present study investigates whether sustainability performance, captured through ESG indicators, is associated with observable reputation signals on digital tourism platforms at the city level. Using a pilot data approach, the research links publicly available ESG indicators for selected tourism cities with platform-based reputation measures derived from user-generated evaluations. By empirically exploring the relationship between sustainability indicators and digital reputation signals, the study provides initial evidence on the potential integration of ESG-informed evaluation into platform reputation systems.

Recent empirical studies have examined the role of online reputation systems in shaping tourism demand and destination competitiveness, highlighting the influence of user-generated ratings and reviews on tourist decision-making [1–3, 8]. At the same time, a growing body of research has focused on sustainability and ESG-related indicators in tourism, emphasizing the importance of environmental quality, social conditions, and governance for long-term destination performance [5–7, 11–15]. However, empirical studies that directly link sustainability performance with platform-based reputation signals remain limited [13–17]. This study contributes to bridging this gap by providing an initial empirical examination of the relationship between ESG indicators and digital reputation at the city level.

Digital tourism platforms have become central infrastructures in contemporary tourism ecosystems, facilitating information exchange, shaping destination visibility, and influencing travel decisions worldwide [1, 8-10]. These platforms rely heavily on reputation systems based on user-generated ratings, reviews, and rankings to evaluate the trustworthiness, quality, and popularity of tourism destinations [2, 11–13]. However, the design of these reputation systems is primarily driven by visibility dynamics and market coordination, and they often face challenges related to transparency, credibility, and the potential manipulation of reviews [2, 9, 14–17].

At the same time, the increasing importance of Environmental, Social, and Governance (ESG) principles in tourism policy and destination management has transformed how tourism systems are evaluated. Sustainability frameworks increasingly rely on indicator-based approaches to measure environmental pressures, social well-being, governance quality, and long-term resilience of tourism destinations [18-23]. Despite the expansion of ESG-oriented evaluations, their connection to digital tourism platform reputation mechanisms remains poorly understood.

This lack of integration creates a structural governance gap. Reputation signals visible to travelers do not necessarily reflect the sustainability performance of destinations, while sustainability assessments used by institutions rarely translate into user-facing decision environments where tourism demand is formed in real time [18, 19, 24, 25]. Consequently, platform-mediated tourism demand may reinforce short-term popularity rather than long-term sustainable development.

Therefore, this study addresses the research question of whether measurable relationships exist between ESG-related sustainability indicators and online reputation signals in digital tourism platforms. By examining this relationship through a pilot empirical design at the city level, the study aims to provide an initial analytical basis for integrating sustainability

performance into platform-based reputation systems and strengthening the governance role of digital tourism platforms in supporting sustainable destination development.

2. Experiments

2.1. Conceptual Model and Hypotheses

This study examines whether city-level sustainability performance, captured through Environmental, Social, and Governance (ESG) indicators, is reflected in observable online reputation signals on digital tourism platforms. Sustainability-related attributes such as environmental quality, safety conditions, and governance effectiveness may influence visitor experience and, consequently, user-generated evaluations of destinations.

However, reputation systems on digital tourism platforms are also shaped by visibility dynamics, popularity effects, and platform attention mechanisms. As a result, sustainability performance may not necessarily translate directly into a stronger digital reputation without explicit integration into platform evaluation systems.

Based on this reasoning, the study proposes the following hypotheses:

- H1 (overall association): Cities with higher overall ESG performance exhibit stronger online reputation on digital tourism platforms.
- H2 (dimension heterogeneity): The relationship between sustainability performance and online reputation differs across ESG dimensions (Environmental, Social, and Governance).
- H3 (signal-type heterogeneity): ESG performance relates differently to evaluative reputation signals (e.g., average attraction ratings) and visibility-based signals (e.g., review volume).

2.2 Data and Sample

2.2.1 Unit of analysis and sampling strategy

The unit of analysis in this study is the city. A pilot sample of 15 tourism cities was selected using a purposive-variation approach in order to capture differences in destination visibility, tourism maturity, and regional context. The final sample includes Paris, Rome, Dubai, Barcelona, Athens, Krakow, Vienna, Baku, Tbilisi, Yerevan, Samarkand, Astana, Istanbul, Cairo, and Marrakech.

The sample combines globally established destinations with emerging or regionally prominent tourism cities, thereby increasing variation in both online reputation indicators and sustainability-related conditions. This diversity enables an exploratory comparison of destinations with different levels of digital tourism visibility. The selection of cities follows a purposive sampling strategy aimed at maximizing variation across key dimensions relevant to the study. Specifically, the sample includes cities with different levels of tourism intensity (highly visited global destinations versus emerging or regionally significant cities), varying degrees of digital platform visibility (as reflected in review activity), and diverse geographic and institutional contexts. This approach allows the study to capture heterogeneity in both sustainability conditions and online reputation signals, which is necessary for exploring potential relationships between ESG performance and platform-based visibility and evaluation. The inclusion of both globally dominant and less internationally visible destinations enables comparison between cities with high platform visibility and those with lower digital prominence.

2.2.2 ESG indicators and data sources

City-level sustainability performance is measured using publicly available ESG-related data. It is operationalized using three comparable indicators: environmental quality (proxied by the Numbeo Pollution Index), social conditions (proxied by the Numbeo Safety Index), and governance effectiveness (derived from the World Bank Worldwide Governance Indicators).

For each city, the following indicators are recorded:

- Environmental (E) – environmental quality indicators related to urban environmental conditions, proxied through pollution-related measures.
- Social (S) – indicators reflecting safety and social well-being within the city environment.
- Governance (G) – institutional quality indicators reflecting governance effectiveness and administrative performance.

To maintain comparability across cities, the study uses indicators that are consistently available across all observations. All variables were collected for the closest available time period.

Environmental data were obtained from the Numbeo Pollution Index (2026 edition), which provides comparative measures of urban environmental quality across cities. Social indicators were derived from the Numbeo Safety Index, reflecting perceived safety and social conditions. Governance indicators were obtained from the World Bank Worldwide Governance Indicators (WGI), specifically the government effectiveness measure, which captures institutional quality and administrative performance.

2.2.3 Platform reputation indicators and data sources

Online reputation is measured using data extracted from TripAdvisor, one of the largest global digital tourism platforms. City-level reputation is operationalized through attraction-level user-generated data aggregated to the city level.

For each city, the data collection procedure follows a standardized process:

1. Open the city page on the selected tourism platform.
2. Navigate to “Things to Do” → “Attractions.”
3. Apply the same sorting rule for all cities.
4. Select the top 10 attractions for each city.
5. Record for each attraction:
   - the average rating scores
   - the total number of reviews.

The selection of the top 10 attractions for each city ensures consistency and comparability across observations, allowing reputation measures to be constructed using a standardized subset of highly visible tourist sites. These attraction-level observations are aggregated into city-level indicators representing an overall destination reputation on the platform.

The data were collected from TripAdvisor using the Traveler Favorites ranking filter on 15 March 2026.

2.3 Variable Construction

2.3.1 ESG measures

To enable comparability across cities, the environmental, social, and governance indicators are standardized before aggregation. Standardization allows variables measured on different scales to be combined into a unified sustainability index.

For each city i, the study constructs the following indicators:

- Environmental score: E_i
- Social score: S_i
- Governance score: G_i

An overall sustainability index is calculated as the arithmetic mean of the three dimensions:

$$ESG_i = (E_i + S_i + G_i) / 3 \qquad (1)$$

This composite indicator represents the overall sustainability performance of each city and serves as the primary explanatory variable in the empirical analysis.

2.3.2 Reputation measures

Using attraction-level ratings and review counts for each city, the study constructs two city-level indicators capturing different dimensions of digital tourism reputation.

Mean attraction rating (evaluative signal)

This indicator measures the average perceived quality of the city's most prominent attractions:

$$RatingMean_i = (1 / K) \times \Sigma_{(j=1 \text{ to } K)} r_{ij} \quad (2)$$

where K = 10 represents the number of attractions considered for each city and r_{ij} denotes the rating of attraction j in city i.

Log-transformed review volume (visibility signal)

Review counts are used as a proxy for platform attention and digital visibility. First, the total number of reviews across the selected attractions is calculated:

$$ReviewTotal_i = \Sigma_{(j=1 \text{ to } K)} c_{ij} \quad (3)$$

where c_{ij} represents the number of reviews for attraction j in city i.

Because review counts are typically highly skewed across destinations, a logarithmic transformation is applied:

$$ReviewLog_i = \ln (1 + ReviewTotal_i) \quad (4)$$

This transformation reduces the influence of extremely popular destinations and improves comparability across cities.

2.4 Empirical Strategy

The empirical analysis is designed as a pilot quantitative test of the relationship between sustainability performance and digital tourism reputation. The objective is to identify preliminary statistical associations between ESG indicators and platform-based reputation signals.

The empirical strategy proceeds in three stages.

2.4.1 Descriptive analysis

The analysis begins with descriptive statistics for all variables in the dataset. Mean values, standard deviations, and minimum and maximum values are calculated to summarize variation across the sampled cities and identify potential outliers.

Table 1 presents the descriptive statistics for all variables.

2.4.2 Correlation analysis

The second step examines pairwise relationships between sustainability indicators and reputation measures. Correlation coefficients are calculated between:

- the composite ESG index and reputation indicators
- each ESG dimension (E, S, and G) and reputation indicators

This step provides initial evidence on whether sustainability performance is associated with digital reputation signals.

Table 2 reports the correlation matrix between ESG indicators and reputation variables.

2.4.3 Regression analysis

To examine these relationships more formally, the study estimates linear regression models with city-level reputation indicators as dependent variables.

First, the analysis evaluates the association between the composite ESG index and destination reputation:

$$Rep_i = \alpha + \beta 1 \, ESG_i + \varepsilon_i \quad (5)$$

Second, the analysis decomposes sustainability into its individual components:

$$Rep\_i = \alpha + \beta E\ E\_i + \beta S\ S\_i + \beta G\ G\_i + \varepsilon\_i \quad (6)$$

where the dependent variable Rep_i represents either:

- RatingMean_i (average attraction rating), or
- ReviewLog_i (log-transformed review volume)

These models allow the study to assess whether sustainability performance and its individual dimensions are associated with variation in digital tourism reputation across cities.

The regression results are reported in Table 3.

To ensure methodological clarity, the analysis combines descriptive statistics, correlation analysis, and linear regression techniques. Correlation analysis is applied to assess the direction and strength of associations between ESG indicators and reputation measures. Linear regression models are then used to estimate the magnitude of these relationships and to examine how overall ESG performance and its individual components (E, S, G) contribute to variation in digital tourism reputation across cities.

Given the exploratory nature of the study and the limited sample size, the analysis is intended to provide preliminary evidence rather than generalizable conclusions.

3. Results and discussion

3.1 Descriptive statistics

Table 1 presents descriptive statistics for the variables used in the empirical analysis. The average attraction rating across the sampled cities is relatively high (mean = 4.50), indicating generally positive evaluations of major tourism attractions on digital platforms. Variation in average ratings is limited (SD = 0.14), suggesting relatively homogeneous evaluations across destinations.

In contrast, review volume shows greater dispersion. The logarithm of total reviews has a mean of 11.18 and ranges from 8.22 to 13.23, indicating substantial differences in platform visibility among cities.

Regarding sustainability indicators, environmental performance (E) exhibits the largest variability across the sample (mean = −61.91; SD = 17.34), reflecting differences in environmental conditions such as pollution levels. Social indicators (S), represented by safety-related metrics, display moderately high values (mean = 62.47; SD = 13.58). Governance indicators (G), based on institutional effectiveness measures, show a mean of 60.43 with comparatively lower variability (SD = 11.45).

The composite ESG index, calculated as the mean of the three dimensions, has an average value of 20.33 and ranges from 3.03 to 45.10. Overall, the descriptive statistics reveal substantial variation in sustainability indicators across cities, while reputation indicators, particularly average ratings, remain relatively stable.

Table 1. *Descriptive statistics*

Variable	Mean	Std. Dev.	Min	Max
rating_mean	4.50	0.14	4.09	4.68
review_log	11.18	1.64	8.22	13.23
E	-61.91	17.34	-90.56	-15.89
S	62.47	13.58	42	83.88
G	60.43	11.45	44.26	80.79
ESG	20.33	10.24	3.03	45.10

3.2 Correlation results

Table 2 reports pairwise correlation coefficients between reputation indicators and ESG-related variables. The correlation between average attraction ratings and review volume is weak

(r = 0.041), indicating that higher ratings are not necessarily associated with greater platform visibility.

Environmental indicators show a moderate positive correlation with average attraction ratings (r = 0.357), while social indicators exhibit a smaller positive relationship (r = 0.181). Governance indicators display a relatively weak correlation with attraction ratings (r = 0.106).

In contrast, review volume demonstrates a strong positive correlation with governance performance (r = 0.669), suggesting that cities with stronger governance conditions tend to exhibit greater visibility on tourism platforms. The relationship between review volume and environmental indicators is weaker (r = 0.222), while social indicators display a negative correlation (r = −0.500).

As expected, the ESG composite index is strongly correlated with its individual components—particularly environmental performance (r = 0.880), followed by governance (r = 0.687) and social indicators (r = 0.558). These relationships confirm the internal consistency of the composite ESG measure.

Overall, the correlation results suggest that different sustainability dimensions may be associated with digital tourism reputation signals in different ways.

Table 2. *Correlation matrix*

Variable	rating_mean	review_log	E	S	G	ESG
rating_mean	1					
review_log	0.041	1				
E	0.357	0.222	1			
S	0.181	-0.500	0.225	1		
G	0.106	0.669	0.580	-0.029	1	
ESG	0.321	0.153	0.880	0.558	0.687	1

3.3 Regression results

Table 3 summarizes the regression estimates for the relationship between ESG performance and digital reputation indicators.

Model 1 examines the relationship between overall ESG performance and destination reputation measured by average attraction ratings. The results indicate a small but positive association (β = 0.0044), suggesting that higher sustainability performance is weakly related to higher online reputation scores. The explanatory power of the model is limited (R^2 = 0.103), which is expected given the exploratory nature of the pilot dataset.

Model 2 evaluates the relationship between ESG performance and platform visibility, measured by the logarithm of total review volume. The results show only a minimal association (β = 0.0246), with ESG explaining approximately 2.4% of the variation in review volume (R^2 = 0.024).

Models 3 and 4 disaggregate ESG into its three dimensions—Environmental (E), Social (S), and Governance (G). In Model 3, where average attraction ratings serve as the dependent variable, environmental performance shows the strongest positive association with ratings (β = 0.00335), followed by a smaller positive effect for social indicators (β = 0.00086). Governance indicators display a weak negative relationship (β = −0.00161). The model explains approximately 14.9% of the variation in attraction ratings (R^2 = 0.149).

Model 4 examines the relationship between ESG dimensions and platform visibility. Governance performance shows the strongest positive association with review volume (β = 0.10088), while environmental (β = −0.00791) and social (β = −0.05559) indicators exhibit small negative relationships.

The model explains a larger share of variation in visibility outcomes (R^2 = 0.683), indicating that governance conditions may be more strongly associated with tourism visibility than other sustainability indicators. This finding indicates that institutional quality and

governance conditions may play a more significant role in shaping tourism visibility than environmental or social factors within platform-mediated environments. This pattern further suggests that digital platform visibility may be more closely linked to institutional and governance-related factors than to environmental or social conditions.

Given the limited sample size and exploratory design of the study, these findings should be interpreted as indicative rather than definitive.

Table 3. *Regression results*

Model	Dependent variable	ESG	E	S	G	R^2
1	rating_mean	0.0044				0.103
2	review_log	0.0246				0.024
3	rating_mean		0.00335	0.00086	-0.00161	0.149
4	review_log		-0.00791	-0.05559	0.10088	0.683

3.4 Interpretation relative to hypotheses

Based on the empirical results, the hypotheses can be interpreted as follows.

- H1 (overall association): partially supported. The regression results show a small positive relationship between the composite ESG indicator and average attraction ratings, although the explanatory power of the model remains limited.
- H2 (dimension heterogeneity): Supported. When ESG is decomposed into its individual components, environmental and social indicators display small positive associations with attraction ratings, while governance indicators show a weak negative relationship.
- H3 (signal-type heterogeneity): Supported. Sustainability indicators relate differently to evaluative and visibility-based reputation signals. Environmental and social indicators appear more closely associated with perceived destination quality, while governance indicators exhibit a stronger relationship with platform visibility.

These results provide the basis for discussing the broader implications of ESG indicators for digital tourism reputation systems. This study adopts a pilot design with a limited sample size to provide initial exploratory evidence. The findings are not intended to be generalizable but rather to establish a preliminary analytical framework for future large-scale research.

4. Conclusion

This study examined whether sustainability performance, measured through Environmental, Social, and Governance (ESG) indicators, is reflected in digital reputation signals on tourism platforms at the city level. Using a pilot dataset of fifteen international tourism destinations, the analysis explored the relationship between ESG indicators and platform-based reputation measures derived from attraction ratings and review volumes.

The results suggest that the relationship between sustainability performance and digital tourism reputation is complex and heterogeneous. Environmental and social indicators appear to show modest positive associations with perceived destination quality, while governance indicators display a stronger relationship with platform visibility measured through review volume. At the same time, the explanatory power of the models remains limited, indicating that digital reputation on tourism platforms is influenced by multiple factors beyond sustainability performance alone.

These findings provide preliminary empirical evidence that sustainability-related conditions may influence different dimensions of digital tourism reputation. More broadly, the results highlight the potential relevance of integrating sustainability indicators into platform-

based reputation systems in order to better align destination visibility with sustainable tourism objectives.

Given the limited sample size and exploratory design of this study, future research should extend the analysis using larger datasets and additional tourism platforms in order to further examine the relationship between sustainability performance and digital destination reputation.

Acknowledgment
Not applicable.

Authors' Declaration
Conflicts of Interest: The author declares no conflict of interest.
Ethical statement: This study used publicly available secondary data obtained from online platforms and international databases. No personal or sensitive user data were collected or processed. Therefore, ethical approval was not required.

Authors' Contribution Statement
Nijat Safarov conceptualized the study, collected and analyzed the data, developed the methodology, and prepared the manuscript.

References

1. Xiang, Z., Gretzel, U.: Role of social media in online travel information search. Tourism Management 31(2), 179–188 (2009). https://doi.org/10.1016/j.tourman.2009.02.016
2. Filieri, R.: What makes an online consumer review trustworthy? Annals of Tourism Research 58, 46–64 (2016). https://doi.org/10.1016/j.annals.2015.12.019
3. Litvin, S.W., Goldsmith, R.E., Pan, B.: Electronic word-of-mouth in hospitality and tourism management. Tourism Management 29(3), 458–468 (2007). https://doi.org/10.1016/j.tourman.2007.05.011
4. Srnicek, N.: Value, rent and platform capitalism. Edward Elgar Publishing (2021). https://doi.org/10.4337/9781802205138.00009
5. World Tourism Organization (UNWTO): UNWTO Tourism Highlights: 2018 Edition. UNWTO (2018). https://doi.org/10.18111/9789284419876
6. OECD: OECD Tourism Trends and Policies 2020. OECD Publishing (2020). https://doi.org/10.1787/6b47b985-en
7. Gössling, S., Hall, C.M., Weaver, D.: Sustainable tourism futures. Routledge (2009). https://doi.org/10.4324/9780203884256
8. Buhalis, D., Law, R.: Progress in information technology and tourism management: 20 years on and 10 years after the Internet—The state of eTourism research. Tourism Management 29(4), 609–623 (2008). https://doi.org/10.1016/j.tourman.2008.01.005
9. Poell, T., Nieborg, D., Van Dijck, J.: Platformisation. Internet Policy Review 8(4) (2019). https://doi.org/10.14763/2019.4.1425
10. Zheng, Y., Luo, Q., Wang, J.: Becoming famous: Producing platform-mediated destination visibility. Annals of Tourism Research 117, 104136 (2026). https://doi.org/10.1016/j.annals.2026.104136
11. Jeacle, I., Carter, C.: In TripAdvisor we trust: Rankings, calculative regimes and abstract systems. Accounting, Organizations and Society 36(4–5), 293–309 (2011). https://doi.org/10.1016/j.aos.2011.04.002
12. Ghose, A., Ipeirotis, P.G., Li, B.: Designing ranking systems for hotels on travel search engines by mining user-generated and crowdsourced content. Marketing Science 31(3), 493–520 (2012). https://doi.org/10.1287/mksc.1110.0700

13. Sparks, B.A., Browning, V.: The impact of online reviews on hotel booking intentions and perception of trust. Tourism Management 32(6), 1310–1323 (2011). https://doi.org/10.1016/j.tourman.2010.12.011
14. Zelenka, J., Azubuike, T., Pásková, M.: Trust model for online reviews of tourism services and evaluation of destinations. Administrative Sciences 11(2), 34 (2021). https://doi.org/10.3390/admsci11020034
15. Otero, J.M.M.: Fake reviews on online platforms: Perspectives from the US, UK and EU legislation. SN Social Sciences 1(7), 181 (2021). https://doi.org/10.1007/s43545-021-00193-8
16. Shukla, A.D., Goh, J.M.: Fighting fake reviews: Authenticated anonymous reviews using identity verification. Business Horizons 67(1), 71–81 (2023). https://doi.org/10.1016/j.bushor.2023.08.002
17. Manoli, A.E.: Platform-mediated local power in tourism. Annals of Tourism Research 118, 104151 (2026). https://doi.org/10.1016/j.annals.2026.104151
18. Torres-Delgado, A., Saarinen, J.: Using indicators to assess sustainable tourism development: A review. Tourism Geographies 16(1), 31–47 (2013). https://doi.org/10.1080/14616688.2013.867530
19. Font, X., Torres-Delgado, A., Crabolu, G., Martinez, J.P., Kantenbacher, J., Miller, G.: The impact of sustainable tourism indicators on destination competitiveness: The European Tourism Indicator System. Journal of Sustainable Tourism 31(7), 1608–1630 (2021). https://doi.org/10.1080/09669582.2021.1910281
20. Back, K.: ESG for the hospitality and tourism research: Essential demanded research area for all. Tourism Management 105, 104954 (2024). https://doi.org/10.1016/j.tourman.2024.104954
21. Lin, M.S., Zhang, H., Luo, Y., Li, Y.: Environmental, social, and governance (ESG) measurement in the tourism and hospitality industry: Views from a developing country. Journal of Travel and Tourism Marketing 41(1), 154–168 (2024). https://doi.org/10.1080/10548408.2023.2293008
22. Camilleri, M.A.: Environmental, social and governance (ESG) factors for sustainable tourism development: The way forward toward destination resilience and growth. Business Strategy and the Environment 35(3), 4057–4082 (2025). https://doi.org/10.1002/bse.70366
23. Shin, H., Jo, Y., Lee, S., Park, J., Cho, J., Kim, H.: ESG for sustainability in hospitality and tourism: A theoretical and practical review with a future research agenda. Journal of Travel Research 65(1), 3–36 (2025). https://doi.org/10.1177/00472875251363629
24. Arzoumanidis, I., Petti, L., Raggi, A.: Online booking platforms: Towards making more sustainable choices. Cleaner Production Letters 3, 100009 (2022). https://doi.org/10.1016/j.clpl.2022.100009
25. Hoffmann, F.J., Braesemann, F., Teubner, T.: Measuring sustainable tourism with online platform data. EPJ Data Science 11(1), 41 (2022). https://doi.org/10.1140/epjds/s13688-022-00354-6
26. Hajizade, S., & Balayev, R. Working methodology for assessing digital transformation risks. UNEC Journal of Computer Science and Digital Technologies
27. Gulmammadov, R. Digital Development Analysis based on cognitive modeling. UNEC Journal of Computer Science and Digital Technologies

Data Availability

The dataset used in this study was constructed from publicly available sources, including TripAdvisor attraction ratings and international sustainability indicators. The compiled dataset used in this analysis is available at:
[Google Sheets link]