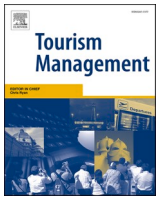
Tourism Management 112 (2026) 105279

Contents lists available at ScienceDirect

Tourism Management

journal homepage: www.elsevier.com/locate/tourman



Understanding municipalities and visitors tourism perspectives: An AI-driven analysis of Instagram posts in Italian and French villages

Filippo Marchesani [a,*], Ginevra Testa [b]

[a] Department of Management and Business Administration, University "G. dAnnunzio" Chieti-Pescara, Pescara, Italy
[b] CIELI - Italian Centre of Excellence on Logistics, Transport and Infrastructure, University of Genoa, Genoa, Italy

ARTICLE INFO

Keywords:
Villages
Communication
Artificial Intelligence
Instagram
Rural tourism
Slow tourism
Visual methodology

ABSTRACT

In the digital tourism age, both cities and villages are being shaped by rapid societal and technological transformations that redefine how they interact with visitors. While these transformations are fluid in cities, driven by the necessity to integrate residents and visitors, they have also become central for villages that engage with specific forms of tourism, particularly slow and rural tourism. It requires villages to change communication methods using social media and digital tools to benefit from these new opportunities for interaction. Research on the interaction between villages and tourists through social media tools is still in its early stages and requires both (i) novel tools and (ii) insights to align visitors' preferences and behaviours with villages' communication strategies. To advance this discourse, this research note contributes to the advancement of visual and digital methodologies in tourism research by proposing a replicable framework based on artificial intelligence for visual content analysis, focusing on 33 rural villages in France and Italy to explore the dual communicative perspectives of visitors and municipalities. To do so, we developed and trained an artificial intelligence-based BOT named "*AI DetectKeywords*" which leverages DALL·E Image Generation technology to systematically analyse and categorize photographs. Our results reveal different nuances in the communication between the villages and the visitors, highlighting different perceptions and interactions in a context that can embrace two similar but distinct tourism paths (i.e., slow tourism and rural tourism). It also offers a useful guide for researchers, policymakers, and tourism communication managers to refine their communication strategies.

1. Introduction

Rural tourism has emerged as a key avenue for sustaining the socio-economic vitality and cultural heritage of villages (Dubois & Sielker, 2022; Grossi & Mussini, 2021; Moliterni et al., 2025; Seaton, 1996; Wu et al., 2022). In Europe, villages encounter pressing challenges such as depopulation, ageing populations, climate change, and fluctuating tourism demand—ranging from *overtourism* in popular hotspots to *undertourism* in less-promoted destinations (Moliterni et al., 2025; Ruiz-Ballesteros & González-Portillo, 2024). Consequently, villages and sub-urban communities must reconsider how to preserve local identities, manage natural and cultural resources, and leverage digital innovations to attract and engage visitors (Park et al., 2019; Zhao & Li, 2023). The relevance of digital innovation in rural tourism is highlighted by several contributions that highlight how this type of innovation enables the economic and sustainable development of rural areas (Cosma et al., 2014, Wang et al., 2024). However, rural destinations face three levels of digital gaps: (i) access to and use of digital technologies, (ii) digital skills and literacy among local stakeholders, and (iii) the ability to strategically leverage these technologies for competitive advantages (Torabi et al., 2023). These digital gaps, in addition to geographical and social isolation, differentiate rural from urban areas (Paiva et al., 2025). Despite the growing interest in tourism innovation, only a few studies have explored the role of innovation in rural destinations (Marasco et al., 2018). Digital innovations can benefit rural tourism destinations in terms of visibility and knowledge, transforming the way communities connect globally, and cultural preservation, promotion and revitalisation (Trunfio et al., 2022; Wang et al., 2024).

* Corresponding author.
E-mail addresses: filippo.marchesani@unich.it (F. Marchesani), ginevra.testa@edu.unige.it (G. Testa).
URL: https://x.com/Marchesani_Fil (F. Marchesani), https://x.com/testa_ginevra (G. Testa).

https://doi.org/10.1016/j.tourman.2025.105279
Received 11 October 2024; Received in revised form 12 June 2025; Accepted 31 July 2025
Available online 6 August 2025

The vital role of villages in cultural and historical identity compels governments to focus on protecting and valorise villages and communities through targeted tourism funding and strategic policies (European Union, 2024).[1] In this context, the valorisation of rural tourism and villages has gained momentum in Europe in recent years. According to the latest report by the European Committee of the Regions (2024, p. 12), the number of overnight stays in rural accommodations has become highest in countries such as France, Germany, Italy, Greece, Austria, and Spain, compared with other European countries. This trend suggests an ongoing shift within the rural tourism domain which, according to Rosalina et al. (2021, p. 134) *involves location, sustainable development, community-based features, and visitor experiences,* where increased visitation converges with other tourism segments to form diverse, hybridized experiences (i.e. sustainable tourism, slow tourism, smart tourism, among others). In this line, slow tourism, recently defined as *a conscious choice to slow down while traveling and taking into account the importance of environment, the local communities, and the tourism experience* (Manthiou et al., 2022, p. 4), plays a key role in combining rural tourism characteristics with visitors' choices and travel mindsets.

These insights highlight the potential of community-based tourism (CBT) and digital strategies to revitalize rural regions, promote authenticity, and support more balanced tourism flows (Manthiou et al., 2022; Moliterni et al., 2025; Ruiz-Ballesteros & González-Portillo, 2024; Zhao & Li, 2023). For example, Moliterni et al. (2025) examine Basilicata's rural tourism untapped cultural and culinary heritage, illustrating how integrating new forms of tourism can spur social and economic progress in rural areas while safeguarding landscapes and local identities. At the same time, Ruiz-Ballesteros and González-Portillo (2024), drawing on an Andalusian case study, emphasize how rural tourism can be actively shaped by local actors' decisions to either expand or limit tourist offerings based on tourism opportunities and local liveability. This approach aligns with slow tourism principles by highlighting the key role of tourism in villages. Local communities integrate with tourists' preferences, mutually influencing each other and creating value for both parties involved. In this line, Zhao and Li (2023) demonstrated that destination authenticity fosters tourist loyalty through place attachment, aligning with slow tourism's focus on authentic, meaningful experiences.

On the nexus between rural tourism valorisation and digital opportunities, villages need to innovate and tailor their interactions with tourists to improve their engagement (Goffi & Cucculelli, 2019; Romão et al., 2018; Zhao & Li, 2023). Recent studies, focusing on the digital transformation of society, concours on the importance of preserving and enhancing the authenticity of villages (Park et al., 2019; Zhao & Li, 2023), reshaping the relationship between these areas and tourists in terms of technology and communication (Marchesani et al., 2024), and align with the current touristic trends. Although technology has compelled many destinations to modify their structures—pushing increasingly toward digital interaction—the adoption of social media in villages remains underexamined. In the tourism context, digital services and social media have come to the forefront of decision-making and visitor behaviors, contributing to strengthen new paradigms such as smart tourism (Buhalis, 2020), sustainable tourism (Bassano et al., 2019), slow tourism (Coca-Stefaniak, 2021; Manthiou et al., 2022), and rural tourism (Rosalina et al., 2021; Ruiz-Ballesteros & González-Portillo, 2024).

These tourism paradigms are established both at the organizational and strategic levels of various destinations, focusing on the management of tourist data and analysing their preferences and behaviours, leveraging their unique characteristics to influence (and interact with) various tourism entities (Bassano et al., 2019; Escobar & Margherita, 2024). In this line, Escobar and Margherita (2024, p. 12) highlight the need to align urban strategies with the actual user needs to meet tourism expectations while simultaneously enhancing the final destination. To do so, the ability to integrate social media and communication strategies enables the creation of new opportunities for tourism destinations (Buhalis, 2020; Gafter & Tchetchik, 2017). Directly reaching users through social media and communication strategies can create new opportunities for villages that need to *"reach people to be reached."* In this case, the importance of creating an emotional and impactful connection with users and the information they generate contributes to fuelling local tourism (Marchesani et al., 2024; Molinillo et al., 2019).

Recent studies have analyzed the interaction between tourism and destinations, focusing on the role of social media with a specific link to the user and tourist to understand their preferences and behavior (Giglio et al., 2019; Leung et al., 2013; Marchesani et al., 2024; Vu et al., 2019). For example, Giglio et al. (2019), through the social network Flickr analysis, have created a predictive model to formulate tourism scenarios based on users' behaviour, identifying the annual trend of photographic activity and highlighting the methodology's effectiveness in providing information on place and users. In this line, Vu et al. (2019), through the social link mining technique, demonstrate how tourists' information in the form of social relationships between travellers can be revealed. Thus, we understand that prior research has begun to explore the interaction between destination and tourism, with a particular focus on the social media platforms utilized by touristic destinations and their relationship with tourism. At the same time, there is still a significant gap in research concerning villages, both in terms of communication and visitors' perception of managing and structuring their social media interactions, as pointed out in recent discussions (Goffi & Cucculelli, 2019; Marchesani et al., 2024; Zhao & Li, 2023).

To fill this research gap, the study explores the promotion of villages as tourist destinations on social media. Specifically, we conduct a novel social media analysis, using Instagram as a proxy, to analyse images published by village "official" channels and content posted by visitors in the villages themselves. Our research builds on a cross-country analysis considering two European countries which share a rich socio-cultural heritage and a high number of overnight stays in tourist accommodation in rural areas.[2] As far as the first element, Italy and France appear to be very close in terms of *T&T Resources Dimension Score* proposed by the World Economic Forum which includes attractions, activities and assets that determine the tourist demand for natural capital (e.g. natural parks and wildlife), cultural assets (e.g. archaeological sites and entertainment facilities) and non-pleasure travel attractions (e.g. the location of nearby globalised cities, companies and universities) across the natural, cultural and non-pleasure resource pillars. It is important to emphasize that these pillars cover both the promotion and development of resources for use as well as the natural, cultural and other heritage of a country.[3] This shared heritage, combined with similar demographic and territorial morphologies, has profoundly influenced their development, architecture, and distribution, positioning them as interesting case studies within the European context (Bendix et al., 2013). The specificities of these nations, shaped by millennia of historical and architectural evolution, have culminated in landscapes of unparalleled beauty and significant tourist appeal (Pearce, 1987). Secondly, in both Italy and France, there is a strong tradition of rural heritage conservation and enhancement, highlighted by specific programs promoted by organizations such as "Borghi più belli d'Italia" and "Les Plus Beaux Villages de France". However, Italy and France boast considerable regional diversity in terms of culture, cuisine, tradition, and dialects. In other geographically

[1] Source: "Tourism and Rural Development," edited by the European Committee of the Regions and the European Union, 2024. Published by the Publications Office of the European Union. Link: https://case-research.eu/app/uploads/2024/06/QG0523426ENN20Tourism20and20rural20development.pdf.

[2] https://case-research.eu/app/uploads/2024/06/QG0523426ENN20Tourism20and20rural20development.pdf.

[3] https://www3.weforum.org/docs/WEF_Travel_and_Tourism_Development_Index_2024.pdf.

neighbouring countries, this level of internal diversity is less pronounced. Moreover, these two countries represent a benchmark for what is defined as "*slow living*" and authenticity, aligning with the principles of rural tourism (Rosalina et al., 2021) and slow tourism (Coca-Stefaniak, 2021; Manthiou et al., 2022) while, in many other contexts, modernization and urbanization have often swept away this kind of rural authenticity, making such experiences increasingly rare (Robinson et al., 2011). Against this backdrop, the implementation of an AI-based tool in this study is not simply an experimental technique, but a response to the structural constraints that characterize rural destinations, such as limited digital skills, scarce professional resources, and the need for replicable and data-driven communication approaches. The use of a rule-based AI BOT offers a transparent and scalable way to analyse content, reducing dependency on manual coding while remaining sensitive to context. At the same time, our approach reflects recent concerns in AI research about the risks of unverified outputs in knowledge production. As noted by Hannigan et al. (2024), the use of generative technologies without critical oversight can result in "*BOTshit*": outputs that sound coherent but are ultimately inaccurate or misleading. Our method mitigates this risk through a grounded and verifiable classification system specifically adapted to the rural tourism setting. In this line, a key contribution lies in advancing visual methodologies (Rose, 2016) in tourism research through the use of AI. Rather than examining how AI is adopted by rural municipalities, we use rural and slow tourism as an empirical context to demonstrate the methodological potential of a rule-based AI BOT for image analysis.

Building on these considerations, our study applies the AI BOT to extract and compare the visual communication strategies of villages and visitors. In this research, we identify the characterizing elements through a novel methodological approach using an Artificial Intelligence BOT called "*AI Detect Keywords*" based on DALL·E Image Generation to rigorously describe the images in keywords. The results indicate that, although there are several commonalities, the images reveal a distinct perceptual divergence: users often perceive aspects that the villages official content does not attempt to highlight. Specifically, our analysis underscores different communication perspectives while village tend to emphasize heritage preservation and local identity, visitors highlight personal experiences and emotional engagement. This divergence can be interpreted through the lenses of rural tourism and slow tourism, where official narratives aim to promote sustainable development and authentic cultural experiences, whereas visitors' perspectives often focus on immersive, leisurely, and community-centered encounters. This observation suggests that incorporating these insights into the villages' communication strategies could significantly enhance the emotional impact of social media interactions, better aligning with visitors' expectations, thereby bridging the perceptual gap and elevating the effectiveness of villages' social media communications.

2. Materials and methods

2.1. Sample of analysis

The unit of analysis is the village, defined as *a group of houses and other buildings that is smaller than a town, usually in the countryside,* according to the Cambridge Dictionary.[4] In this study, we selected a total of 33 villages (one per region), ensuring a stratified sample reflecting the heterogeneity of geographic distribution, tourist proximity, and economic development across the Italian (20) and French (13) regions. The population of the selected villages ranges from 95 for Sant'Antonino (France) to 9025 for Asolo (Italy). This approach aims to capture the variance within countries and reflects the complexity and diversity of tourism behaviours and villages' communications across different economic, location, and tourism proximities levels, ensuring the reliability and validity of our findings within the broader discourse on cultural heritage and tourism development.

The selection process is based on international standards as it considers villages chosen from those recognized by the International Federation of "Les Plus Beaux Villages de la Terre". These villages are certified in Italy, with the parameter ISO 9001 (for services aimed at enhancing, maintaining, and recovering national cultural heritage, memories, and monuments, and promoting tourism in adhering municipalities), and in France, through the Conseil National du Tourisme (National Tourist Board), and represent a high standard of cultural and historical relevance.[5] Thus, we considered the classification proposed by each sub-association (i.e., "I Borghi Più Belli d'Italia" in Italy and "Les Plus Beaux Villages de France" in France) to define our sample of analysis. To capture the essence of touristic attractiveness and the impact of each village within its geographical area, we selected the smallest village in terms of an active population (residents) from each region. This criterion was adjusted in cases where a village did not provide an official social media page on its website; in such instances, the subsequent smallest village was considered, ensuring a methodologically robust sample selection. The geographical distribution of the 33 selected villages is illustrated in Fig. 1.

2.2. Methodological approach

Our research was predicated upon a dual-level analysis encompassing both the public sphere, defined as the official communications disseminated by municipal authorities, and the private sphere, construed as content generated by individual visitors. We adopt Instagram as our social media platform for three primary considerations: (i) the universal adoption of this platform by the study villages, (ii) Instagram's unique ability to facilitate a bifurcated analysis encompassing both public and private communication levels, (iii) its demonstrable reach and user engagement across a broad demographic spectrum, in contrast to the more age-segmented audiences typically associated with other social media platforms.[6]

For each selected village were selected the (i) ten more recent and most liked photographs from the village's official Instagram page and (ii) ten popular and recent photographs posted by tourists on Instagram using the geographical tag for the village's location. The sample of photos collected considers the most recent photos advanced by Instagram, according to its operating algorithm based primarily on relevance, interaction, and timeliness of content to generate visibility (Cotter, 2019), reaching up to the time of the analysis conducted in May 2024. In selecting photographs, we established specific inclusion and exclusion criteria to ensure the homogeneity of the sample and minimize bias related to subjective evaluations of the researchers. Photographs containing text and writing (up to 35 percent), photo albums, and photographs used for commercial or advertising purposes (e.g., product sales and business marketing) were excluded from the sample. To ensure a rigorous process, exclusion for any of these reasons leads to the selection of the next image in the post.

At the end of this process, 660 photos were collected, divided respectively into 330 photos shared by municipalities authorities and 330 photos shared by the public, specifically 400 photos related to Italian villages and 260 related to French villages. The selected

[4] Source: https://dictionary.cambridge.org/dictionary/english/village.

[5] Note: The Federation is composed of multiple national associations that share the same core values of heritage protection, preserving tradition, solidarity, and rural development. For further details, see the Italian Association (https://borghipiubelliditalia.it/) and the French Association (https://lpbvt.org/).

[6] Source: Data from 2023 on the usage and target audience of social platforms.
https://wearesocial.com/wp-content/uploads/2023/03/Digital-2023-Global-Overview-Report.pdf.

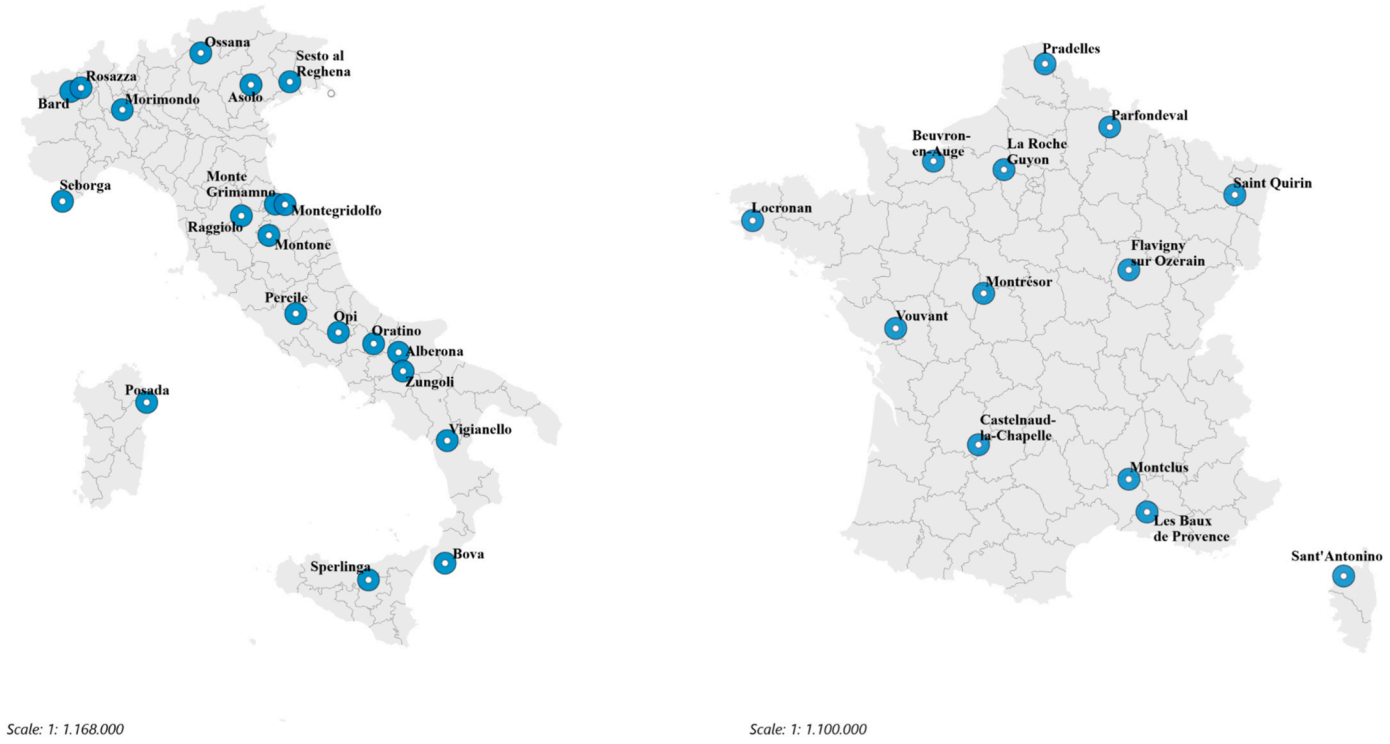


Fig. 1. Location of the selected villages.
Source: Own Elaboration

photographs are cataloged in a repository and are available in endnote.[7]

2.3. AI-driven procedure for pictures analysis

To analyse each image and identify the characterizing elements within it, we employed a novel methodological approach. This method is grounded in the application of machine learning and artificial intelligence to rigorously assess and categorize each image based on its content. To do so, we created an AI BOT named AI_DetectKeywords ,[8] which has been trained to systematically analyse photographs. To enhance the robustness of the analysis, the BOT was developed around a structured taxonomy of visual elements and a rule-based classification framework. The system integrates a Convolutional Neural Network (CNN) for feature detection and a Natural Language Processing (NLP) module that maps each visual element to a stable and interpretable keyword. Each processed image undergoes multi-level validation to verify the accuracy of the assigned keywords, reducing possible bias and improving data reliability. The methodological contribution of using this innovative approach makes it possible to overcome time-consuming processes, reduce the possibility of human error, as well as the scalability and machine learning of the system. Additionally, the system incorporates a weighted scoring algorithm to prioritize the most visually salient elements. Specifically, the algorithm calculates the percentage of the image area occupied by each detected element (e.g., 25 % tree, 10 % church, 8 % fountain) and selects the ten elements with the highest visual prominence. This approach ensures that only the dominant components of each image are retained for analysis, avoiding background bias or marginal features.

To ensure consistency and objectivity, inclusion and exclusion criteria were established. An element is retained only if (i) it reaches a minimum confidence threshold of 85 % in detection, (ii) it appears with clear structural boundaries and no overlap or occlusion, and (iii) it can be consistently identified across images and contexts. Abstract features (e.g., emotions, atmospheres), low-resolution components, and visually ambiguous objects are systematically excluded to preserve analytical rigor. These conditions aim to ensure semantic stability and reduce classification misalignment across different visual environments. In addition, elements are filtered using rule-based logic to eliminate those with high intra-class variability or that show inconsistent edge detection across frames. This procedural standardization enhances reproducibility and ensures that only clearly interpretable and context-independent visual objects are encoded as keywords.

For validation purposes, we implemented a multi-tiered verification protocol consisting of three complementary procedures. First, an internal performance evaluation on a hold-out validation set yielded an accuracy of 98.27 %. Second, reverse validation was conducted on the first 20 % of classified images to confirm consistency of the output after model refinement. Third, we carried out geographic robustness test using VPNs across three locations (Italy, Japan and the U.S) to assess the system's stability under varying network and server conditions. The cross-location variance in keyword classification remained below 1.3 %, confirming the tool's reliability across different deployment settings. This automated workflow enables large-scale image analysis with minimal human intervention, increasing efficiency and reducing potential observer biases.

The final output programmed into the software generates ten representative keywords for each image, ensuring consistency across all photographs included in the database to minimize inferences and potential biases. This methodological protocol was employed to discern the nuances of visual communication employed by the villages and to understand the perceptions and communicative expressions of visitors. Fig. 2 shows an example of the 10 keywords extracted by the AI bot for a sample image.

Building upon this software, the process was automated for each village to assess perspectives from both the municipality and visitors.

[7] Link: https://mega.nz/folder/vRsERAqa#a6HnqA1b0OfA7EMzouvvLg. https://mega.nz/folder/vRsERAqa#a6HnqA1b0OfA7EMzouvvLg.

[8] The BOT (AI DetectKeywords) is available at the following link: https://chatgpt.com/g/g-Zmj5HjbQh-ai-detectkeywords

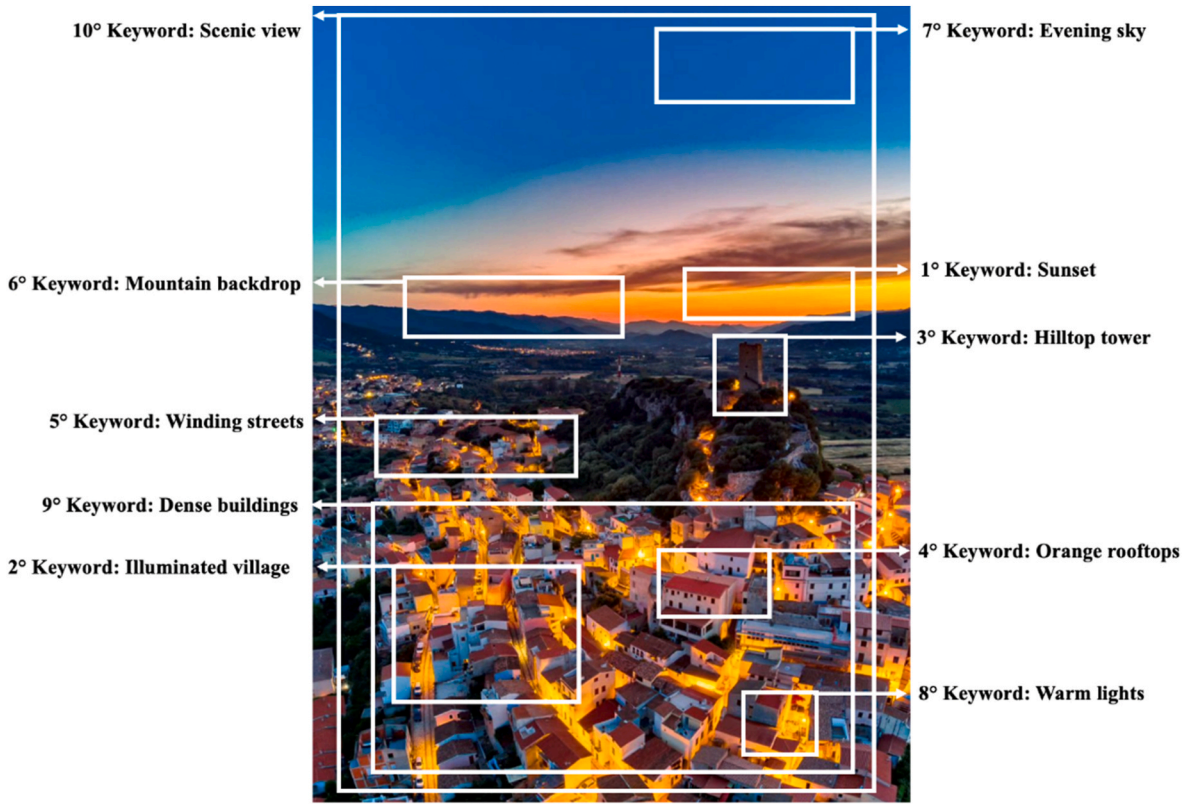


Fig. 2. Example words detention from image.
Source: Own elaboration

This procedure, which can also be applied in other contexts and with different analysis samples, allows us to encode in a clear and replicable manner the key elements of the analysis units, i.e., the selected photographs.

3. Data analysis and results

In the following, we present and discuss the main results that emerged from the keyword detection extracted using the AI BOT. Within

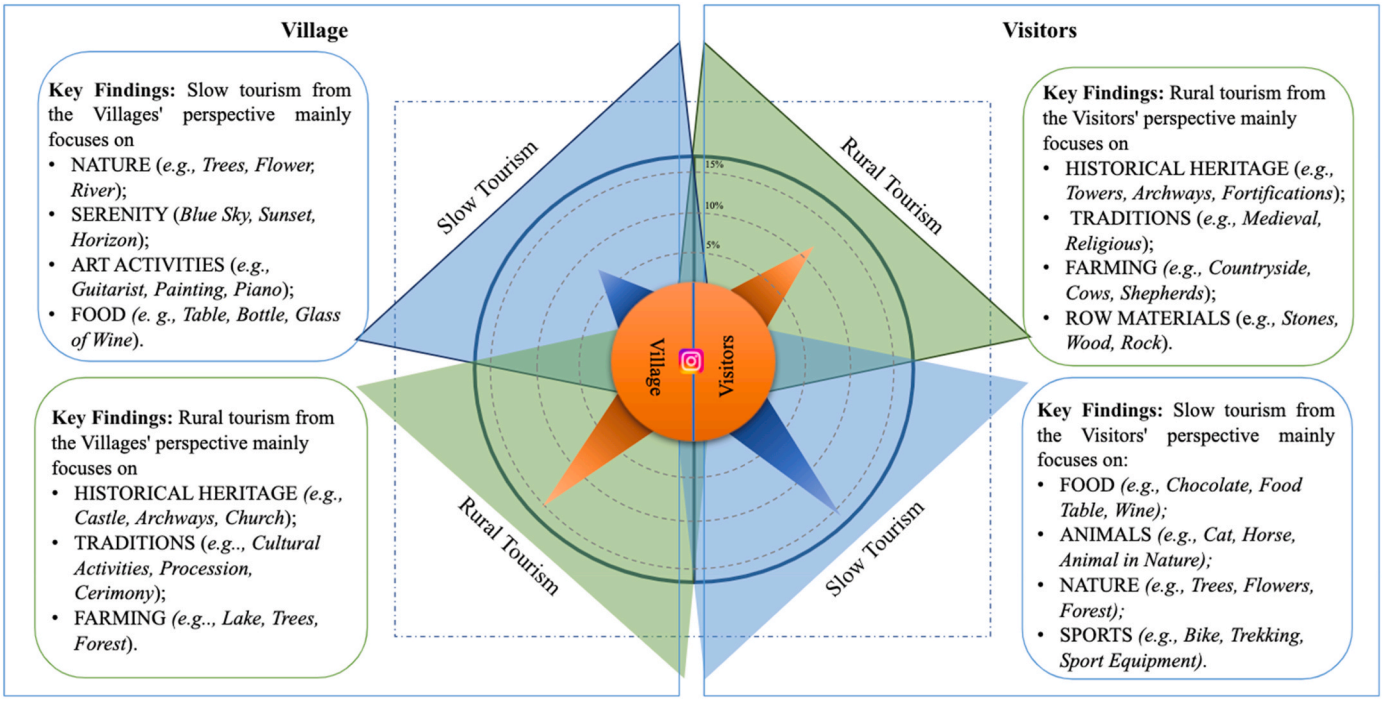


Fig. 3. Conceptual framework.
Source: Own elaboration

this large sample of keywords (6600), no merging activities were carried out between words with similar meanings to preserve any nuances of the individual terms present and fully maintain their integrity. To highlight the differences between the two perspectives of analysis, it was necessary to go beyond the mere consideration of the frequency of the keywords included in the sample as they showed a certain convergence for the 15 most present keywords (Tables 1A, A2, and A3 in the Appendix). Therefore, we focused our attention on all the keywords included in the sample (available to the reviewer) to delineate some reference clusters within them, comparing and discussing only in case of disagreement.

To analyse the data, we utilized MAXQDA24, an AI-based data analysis software that is particularly well-suited for this study due to its advanced text analysis capabilities, which enable the precise identification and clustering of keywords across large datasets. After importing the (i) academic definitions and (ii) the top three most-cited papers related to the concepts of Slow Tourism and Rural Tourism, we employed MAXQDA24's text retrieval functions to systematically analyse the 6600 keywords. This clustering method was adopted to group these keywords based on their relation to slow and rural tourism, as well as their frequency and co-occurrence, ensuring a rigorous analysis of patterns within the data. This approach allowed for a nuanced understanding of how these concepts are discussed from both municipal and public perspectives.

Fig. 3 shows the results of the analysis conducted with MAXQDA24 software. Fig. 3 highlights the intensity of keywords attributable to the concept of slow tourism and rural tourism in the two perspectives of villages and visitors. From the villages' perspective, rural tourism is the predominant aspect, as evidenced by the orange triangle, while in the visitors' perspective, slow tourism emerges more, as evidenced by the size of the blue triangle exiting the centre of the figure. This process made it possible to capture different nuances of the phenomenon in question and to delineate different clusters in line with the concepts of slow tourism (Manthiou et al., 2022) and rural tourism (Rosalina et al., 2021), highlighted in the 4 squares on the side of the figure that bring out some clusters such as food and nature, for slow tourism, and traditions and historical heritage, for rural tourism.

The results highlight three key points: (i) the presence of commonalities between the slow and rural tourism, (ii) the need for village communications to align local communication strategies with visitors' perceptions, and (iii) the importance of understanding and aligning social media communications on visitors and their networks (e.g., interaction with followers considered as future potential visitors).

Specifically, moving beyond the obvious symmetries between visitors and villages keywords, the analysis reveals different perceptions and unique aspects, highlighting a dual perspective among visitors and villages. From the visitors' perspective, both slow tourism and rural tourism emerge significantly, with slow tourism accounting for 16.17 % and rural tourism for 11.73 %. In contrast, the villages' communication strategies are heavily focused on rural tourism, constituting 15.20 %, while only marginally addressing the concept of slow tourism, which stands at 7.32 %.[9] Fig. 3 illustrates a notable disparity in emphasis, with visitors showing a higher concentration on slow tourism compared to villages, whereas villages place a greater emphasis on rural tourism relative to visitor perceptions. From these differences, municipalities can learn how to better align their social media communication strategies (often based on cultural, historical, and local perception) to maximize their visibility and visitor engagement, while considering strategic constraints for villages such as limited financial and human resources (e.g., limited technological investments, few employees, limited digital skills among the others).

[9] Note: The percentages of keywords within each cluster were calculated after excluding words common to both visitors' and villages' perspectives. This systematic approach ensures that the analysis accurately captures distinct thematic elements, thereby enhancing the validity and reliability of the study's findings.

4. Discussion and conclusion

This research note explores the dual perspectives of visitors and villages in the context of slow and rural tourism through the analysis of social media interactions. We contribute to the early debate on the interplay between villages, social media, and tourism perceptions (Giglio et al., 2019; Leung et al., 2013; Marchesani et al., 2024; Vu et al., 2019) through the analysis of Instagram content from village channels and visitors-generated posts. We propose a conceptual framework that highlights the discrepancies between visitor perceptions and municipal communication strategies, advancing our understanding of how villages can more effectively leverage social media to enhance tourist engagement. In this way, our study provides valuable insights into aligning visitor expectations with local village promotional efforts.

Specifically, this research note contributes to the practical and academic debate in several ways. First, it underscores the convergence of rural and slow tourism for heritage destinations, demonstrating that visitor engagement could be significantly enhanced when communication strategies reflect the authentic experiences sought by tourists, for example, at the level of contact with nature or practicing sports for their leisure and wellness. Second, we introduce a novel methodological approach based on AI to analyse and code social media content, offering a new lens for examining tourist behaviour and preferences in villages. This methodological innovation also contributes to the ongoing debate on how artificial intelligence can be responsibly integrated into contemporary research, extending its scope of application to rural and tourism destinations. Although AI has a strong potential for improving communication analysis and supporting strategic decision-making, its application in low-resource environments, like villages, requires careful contextual adaptation. Since rural areas often lack the digital infrastructure and human capital to effectively monitor online engagement, rule-based and verifiable AI tools emerge as useful and actionable solutions. At the same time, this research contributes to the ongoing debate on the role of artificial intelligence in the social sciences, proposing a solid methodological framework aimed at mitigating the risks associated with the uncritical adoption of BOTs and AI tools. The aim is to move beyond what early criticisms labelled as "*BOTshit*" (Hannigan et al., 2024), the generation of unreliable or misleading output, toward a more rigorous and meaningful vision of AI as a "*BOTwise*": a well-founded, interpretable, and methodologically robust tool for researchers and decision-makers.

At the practical level, aligning communication strategies with user perceptions, local authorities can enhance the authenticity and impact of their tourism promotion and communication efforts by achieving a higher level of visibility. This would promote the achievement of better communication performance by effectively and efficiently using the human and financial resources available to villages. This communication alignment would enable the creation of more effective communication campaigns that resonate better with potential visitors, fostering greater engagement and higher visitation rates. By exploring visitors' interactions and behaviours (also considering network responsiveness), villages can enhance their communication strategies by emphasizing aspects that are more appreciated by the visitors and can increase their engagement and interactions. Understanding the tourists' viewpoint and the impact they have on their stakeholders' network is crucial for elevating the communicative potential of villages, which typically do not rely on specialized communication agencies or actors or often engage in communication that is not very useful and effective for the public.

Moreover, aligning with visitors' perspectives allows for the capture of tourists' perceptions and visions, which in turn indirectly promote the village itself through spontaneous user-generated content (UGCs) that can foster potential positive word-of-mouth (eWoM), a highly valuable resource for villages as it is deemed reliable and particularly strong for

influencing other parties. UGCs and eWoM, being perceived as highly authentic by the public, are a much more powerful marketing tool than communication conveyed directly by the villages. In this line, local authorities could include visitors in the village's communication strategy, for example, by sharing user-generated content on their official channels, as some limited villages already do, to strengthen the success of their social media communication. This will lead villages to overcome the dichotomy between "rural" and "slow" tourism, reflecting visitors' perceptions in a more nuanced and comprehensive way to align with current and future tourism prospects.

This work is not without limitations. First, the sample is limited to only two countries, Italy and France, which may restrict the generalizability of the findings. Future research should aim to include a more diverse sample encompassing additional countries to emphasize individual nations' differences in tourism practices and preferences. Additionally, the innovative methodology employed in this study could be extended to other social media platforms such as Facebook or TikTok, with different communication formats in the first case visual content and the second case video content. This extension would capture the perceptions of a broader audience, including tourists from more mature (Generations Baby Boomers and X) and younger generations (Generations Y and Z), thereby highlighting potential differences within these groups. Moreover, some photos may be influenced by the user base and investments of the villages (visitors and villages promotion of the posts), which can affect the selection of images by refocusing attention on villages sites where investments have been particularly concentrated. Future research could expand the sample by coding content of different social media in addition to blogs, websites, and videos (e.g., YouTube), which are all significant drivers in the communication of slow tourism and rural tourism. Finally, although the AI BOT has demonstrated excellent performance metrics, its accuracy may still be affected by the complexity of certain visual inputs, compromising the consistency of recognition and classification in more ambiguous cases. This reflects a broader methodological limitation tied to the current constraints of image-based analysis. Additionally, as the model was trained primarily on images related to rural settings and tourism, its direct applicability to other domains (e.g., urban environments, advertising, or indoor contexts) may require substantial readjustments in terms of keyword structure and visual taxonomy. Future research could address these challenges (and opportunities) by expanding and diversifying the training dataset, thereby avoiding potential biases and improving the model's generalizability. These constraints also open promising future avenues for further investigation, particularly in testing and refining AI tools across different types of tourism, communication formats, and visual contexts. In this line, the proposed rule-based AI BOT contributes to expanding the use of artificial intelligence within tourism research by offering a robust and replicable tool for image-based analysis. While rural and slow tourism serve as empirical contexts, this research note broadens existing visual methodologies discourse (Rose, 2016) and provides a foundation for future digital methods applied across diverse tourism domains, supporting researchers and practitioners in extracting structured insights from the growing volume of visual content increasingly used in the tourism sector and its industries.

CRediT authorship contribution statement

Filippo Marchesani: Writing – original draft, Visualization, Supervision, Software, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Ginevra Testa:** Writing – original draft, Visualization, Software, Resources, Project administration, Methodology, Formal analysis, Data curation, Conceptualization.

Impact statement

This is an original research note that explores the evolving interplay between villages and visitors in terms of social media communication. Utilizing an AI-driven approach, this study highlights the different nuances in the communication between municipalities and visitors, revealing diverse perceptions and interactions. It examines how these dynamics can support two similar but distinct tourism paths: slow tourism and rural tourism.

In recent years, several studies in the literature have explored the interaction between tourism and cities, focusing on social media to understand tourists' preferences and behavior. However, few studies have analyzed these dynamics in small and rural villages. To fill this research gap, this study proposes a research protocol (made fully available to reviewers, editors, and readers for both data and tools) to study images posted on Instagram by the official pages of villages and content generated and posted by the public.

The approach is based on artificial intelligence (AI), specifically a BOT called "AI Detect Keywords," which leverages DALL-E Image Generation technology that we have trained and guided to systematically analyse and categorize all elements included in a photograph. The sample consists of 33 villages distributed across different parts of Italy and France, with 660 photos analyzed and 6600 keywords to propose a conceptual framework. All data and photos are available in anonymous folders for readers' access.

We believe that our findings offer valuable implications for both policymaking and researchers, in line with the ethos *Tourism Management*, by providing fresh insights into the nexus of tourism, small and rural villages, social media, and societal challenges.

Declaration of competing interest

None.

Appendix

Table A1
15 Most Popular Keywords Overall (Authors' elaboration)

TOTAL			FRANCE			ITALY		
Keywords	Frequency	Percentage	Keywords	Frequency	Percentage	Keywords	Frequency	Percentage
Trees	194	2,94 %	Trees	86	3,31 %	Trees	108	2,70 %
Blue Sky	103	1,56 %	Blue sky	60	2,31 %	Blue Sky	43	1,08 %
Hills	76	1,15 %	Hills	36	1,38 %	Hills	40	1,00 %
Stone Wall	67	1,02 %	Stone wall	32	1,23 %	Grass	39	0,98 %
Grass	64	0,97 %	Windows	29	1,12 %	Stone buildings	39	0,98 %
Windows	61	0,92 %	Bushes	28	1,08 %	Stone Wall	35	0,88 %
Stone buildings	60	0,91 %	Clouds	28	1,08 %	Windows	32	0,80 %

(*continued on next page*)

Table A1 (*continued*)

TOTAL			FRANCE			ITALY		
Keywords	Frequency	Percentage	Keywords	Frequency	Percentage	Keywords	Frequency	Percentage
Overcast Sky	46	0,70 %	Grass	25	0,96 %	Archway	31	0,78 %
Archway	45	0,68 %	Shadows	25	0,96 %	Clear Sky	31	0,78 %
Clouds	45	0,68 %	Sunlight	22	0,85 %	Mountains	31	0,78 %
Shadows	45	0,68 %	Village	22	0,85 %	Bell Tower	28	0,70 %
Stone Building	45	0,68 %	Outdoor setting	21	0,81 %	Overcast Sky	27	0,68 %
Outdoor setting	44	0,67 %	Stone buildings	21	0,81 %	Church	26	0,65 %
Church	41	0,62 %	Stone walls	21	0,81 %	Nighttime	25	0,63 %
Bell Tower	40	0,61 %	Stone building	20	0,77 %	Stone Building	25	0,63 %
TOTAL		**6600**	**TOTAL**		**2600**	**TOTAL**		**4000**

Table A2
15 Most Popular Keywords – Municipalities' Perspective

TOTAL			FRANCE			ITALY		
Keywords	Frequency	Percentage	Keywords	Frequency	Percentage	Keywords	Frequency	Percentage
Trees	106	3,21 %	Trees	51	3,92 %	Trees	55	2,75 %
Blue Sky	43	1,30 %	Blue sky	31	2,38 %	Hills	20	1,00 %
Hills	38	1,15 %	Stone wall	20	1,54 %	Grass	19	0,95 %
Stone Wall	35	1,06 %	Bushes	18	1,38 %	Buildings	15	0,75 %
Grass	32	0,97 %	Hills	18	1,38 %	Overcast Sky	15	0,75 %
Shadows	26	0,79 %	Shadows	15	1,15 %	Stone Wall	15	0,75 %
Overcast Sky	25	0,76 %	Village	14	1,08 %	Archway	14	0,70 %
Windows	25	0,76 %	Grass	13	1,00 %	Clear sky	14	0,70 %
Bushes	24	0,73 %	Windows	13	1,00 %	Bell Tower	13	0,65 %
Sunset	22	0,67 %	Branches	12	0,92 %	Mountains	13	0,65 %
Bell Tower	20	0,61 %	Sunlight	12	0,92 %	Nighttime	13	0,65 %
Buildings	20	0,61 %	Clouds	11	0,85 %	Snow	13	0,65 %
Horizon	20	0,61 %	Horizon	11	0,85 %	Sunset	13	0,65 %
Village	20	0,61 %	Outdoor setting	11	0,85 %	Blue Sky	12	0,60 %
Outdoor setting	19	0,58 %	Stone building	11	0,85 %	People	12	0,60 %
TOTAL		**3300**	**TOTAL**		**1300**	**TOTAL**		**2000**

Table A3
15 Most Popular Keywords – Visitors' Perspective

TOTAL PUBLIC			FRANCE			ITALY		
Keywords	Frequency	Percentage	Keywords	Frequency	Percentage	Keywords	Frequency	Percentage
Trees	87	2,64 %	Trees	35	2,69 %	Trees	52	2,60 %
Blue Sky	59	1,79 %	Blue sky	29	2,23 %	Stone buildings	31	1,55 %
Stone buildings	44	1,33 %	Hills	18	1,38 %	Blue Sky	30	1,50 %
Hills	37	1,12 %	Clouds	17	1,31 %	Windows	21	1,05 %
Windows	37	1,12 %	Windows	16	1,23 %	Grass	19	0,95 %
Grass	31	0,94 %	Stone buildings	13	1,00 %	Hills	19	0,95 %
Stone Wall	30	0,91 %	Stone walls	13	1,00 %	Mountains	18	0,90 %
Archway	29	0,88 %	Archway	12	0,92 %	Stone Wall	18	0,90 %
Clouds	27	0,82 %	Grass	12	0,92 %	Archway	17	0,85 %
Stone Building	26	0,79 %	Stone wall	12	0,92 %	Church	17	0,85 %
Church	24	0,73 %	Woman	12	0,92 %	Potted plants	17	0,85 %
Woman	24	0,73 %	Bushes	10	0,77 %	Stone Building	17	0,85 %
Clear Sky	23	0,70 %	Castle	10	0,77 %	Clear Sky	16	0,80 %
Cloudy sky	23	0,70 %	Outdoor setting	10	0,77 %	Bell Tower	15	0,75 %
Cobblestone Path	23	0,70 %	Shadows	10	0,77 %	Cobblestone Path	15	0,75 %
TOTAL		**3300**	**TOTAL**		**1300**	**TOTAL**		**2000**

References

Bassano, C., Barile, S., Piciocchi, P., Spohrer, J. C., Iandolo, F., & Fisk, R. (2019). Storytelling about places: Tourism marketing in the digital age. *Cities, 87*(June 2018), 10–20. https://doi.org/10.1016/j.cities.2018.12.025

Bendix, R. F., et al. (2013). Heritage regimes and the State. In *Heritage regimes and the State*. https://doi.org/10.4000/books.gup.348

Buhalis, D. (2020). Technology in tourism-from information communication technologies to eTourism and smart tourism towards ambient intelligence tourism: A perspective article. *Tourism Review, 75*(1), 267–272. https://doi.org/10.1108/TR-06-2019-0258

Coca-Stefaniak, J. A. (2021). Beyond smart tourism cities – Towards a new generation of "wise" tourism destinations. *Journal of Tourism Futures, 7*(2), 251–258. https://doi.org/10.1108/JTF-11-2019-0130

Dubois, A., & Sielker, F. (2022). Digitalization in sparsely populated areas: Between place-based practices and the smart region agenda. *Regional Studies, 56*(10), 1771–1782. https://doi.org/10.1080/00343404.2022.2035707

Escobar, S. D., & Margherita, E. G. (2024). Assessing barriers to smart tourism cities from a TALC perspective: A best-worst method. *Current Issues in Tourism*, (May), 1–16. https://doi.org/10.1080/13683500.2024.2352612
European Committee of the Regions. (2024). *Tourism and rural development*. European Union. https://doi.org/10.2863/099682
Gafter, L. M., & Tchetchik, A. (2017). The role of social ties and communication technologies in visiting friends tourism- A GMM simultaneous equations approach. *Tourism Management, 61*, 343–353. https://doi.org/10.1016/j.tourman.2017.02.024
Giglio, S., Bertacchini, F., Bilotta, E., & Pantano, P. (2019). Using social media to identify tourism attractiveness in six Italian cities. *Tourism Management, 72*(January 2018), 306–312. https://doi.org/10.1016/j.tourman.2018.12.007
Goffi, G., & Cucculelli, M. (2019). Explaining tourism competitiveness in small and medium destinations: The Italian case. *Current Issues in Tourism, 22*(17), 2109–2139. https://doi.org/10.1080/13683500.2017.1421620
Grossi, L., & Mussini, M. (2021). Seasonality in tourist flows: Decomposing and testing changes in seasonal concentration. *Tourism Management, 84*(June 2019), Article 104289. https://doi.org/10.1016/j.tourman.2021.104289
Hannigan, T. R., McCarthy, I. P., & Spicer, A. (2024). Beware of botshit: How to manage the epistemic risks of generative chatbots. *Business Horizons, 67*(5), 471–486.
Leung, D., Law, R., van Hoof, H., & Buhalis, D. (2013). Social media in tourism and hospitality: A literature review. *Journal of Travel & Tourism Marketing, 30*(1–2), 3–22. https://doi.org/10.1080/10548408.2013.750919
Manthiou, A., Klaus, P., & Luong, V. H. (2022). Slow tourism: Conceptualization and interpretation – A travel vloggers' perspective. *Tourism Management, 93*. https://doi.org/10.1016/j.tourman.2022.104570
Marchesani, F., Masciarelli, F., & Ceci, F. (2024). Digital trajectories in contemporary cities : Exploring the interplay between digital technology implementation , the amplitude of social media platforms , and tourists inflow in cities. *Cities, 146*(July 2023), Article 104749. https://doi.org/10.1016/j.cities.2023.104749
Molinillo, S., Anaya-Sánchez, R., Morrison, A. M., & Coca-Stefaniak, J. A. (2019). Smart city communication via social media: Analysing residents' and visitors' engagement. *Cities, 94*(June), 247–255. https://doi.org/10.1016/j.cities.2019.06.003
Moliterni, S., Zulauf, K., & Wagner, R. (2025). A taste of rural: Exploring the uncaptured value of tourism in Basilicata. *Tourism Management, 107*(September 2023), Article 105069. https://doi.org/10.1016/j.tourman.2024.105069
Park, E., Choi, B. K., & Lee, T. J. (2019). The role and dimensions of authenticity in heritage tourism. *Tourism Management, 74*. https://doi.org/10.1016/j.tourman.2019.03.001
Pearce, D. G. (1987). Spatial patterns of package tourism in Europe. *Annals of Tourism Research, 14*(2). https://doi.org/10.1016/0160-7383(87)90084-3
Romão, J., Kourtit, K., Neuts, B., & Nijkamp, P. (2018). The smart city as a common place for tourists and residents: A structural analysis of the determinants of urban attractiveness. *Cities, 78*(November 2017), 67–75. https://doi.org/10.1016/j.cities.2017.11.007
Rosalina, P. D., Dupre, K., & Wang, Y. (2021). Rural tourism: A systematic literature review on definitions and challenges. *Journal of Hospitality and Tourism Management, 47*. https://doi.org/10.1016/j.jhtm.2021.03.001
Rose, G. (2016). *Visual methodologies: An introduction to researching with visual materials*. SAGE.
Ruiz-Ballesteros, E., & González-Portillo, A. (2024). Limiting rural tourism: Local agency and community-based tourism in Andalusia (Spain). *Tourism Management, 104*(November 2023). https://doi.org/10.1016/j.tourman.2024.104938
Seaton, A. V. (1996). Hay on Wye, the mouse that roared: Book towns and rural tourism. *Tourism Management, 17*(5), 379–382. https://doi.org/10.1016/0261-5177(96)84078-7
Vu, H. Q., Law, R., & Li, G. (2019). Breach of traveller privacy in location-based social media. *Current Issues in Tourism, 22*(15), 1825–1840. https://doi.org/10.1080/13683500.2018.1553151
Wu, M. Y., Wu, X., Li, Q. C., & Tong, Y. (2022). Community citizenship behavior in rural tourism destinations: Scale development and validation. *Tourism Management, 89*(November 2021), Article 104457. https://doi.org/10.1016/j.tourman.2021.104457
Zhao, Z. F., & Li, Z. W. (2023). Destination authenticity, place attachment and loyalty: Evaluating tourist experiences at traditional villages. *Current Issues in Tourism, 26*(23), 3887–3902. https://doi.org/10.1080/13683500.2022.2153012

Filippo Marchesani. Filippo Marchesani is a researcher at the Department of Management and Business Administration at the University "G. d'Annunzio" Chieti-Pescara. He holds his PhD in Accounting, Management and Business Economics. He was a visiting researcher at the University of Girona (Spain). His research interests focus on city competitiveness, Smart Cities, Smart Tourism, Innovation and Entrepreneurship. He serves on the editorial board of Springer Nature Business & Economics Journal and is peer-reviewed for several international journals. He has recently published these issues in Technovation, Entrepreneurship & Regional Development, International Marketing Review, Technological Forecasting and Social Change, Cities, Journal of Cleaner Production, Current Issues in Tourism, and International Journal of Tourism Cities among others. He also published a book with Emerald Publishing and contributed to several Elsevier books.

Ginevra Testa. Ginevra Testa is a Research Fellow at the University of Genoa, CIELI - Italian Centre of Excellence on Logistics, Infrastructure and Transport (Genoa, Italy). She obtained her PhD in Sea Science and Technology, Logistics and Transport Curriculum at the University of Genoa, CIELI (XXXVI Cycle) with a final dissertation entitled: "Social media communication during health crises: an insight from the cruise industry". Her main research interests focus on crisis communication, social media communication, strategic business management, and tourism management.