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CRITICAL ANALYSIS OF USING NETNOGRAPHIC, VISUAL, AND BIG DATA METHODS ON FOOD TOURISM RESEARCH

Nonny Aji Sunaryo[1], Putu Sucita Yanthy [2]
[1]Faculty of tourism, Udayana University, Indonesia
[2] Faculty of Vocational Studies, State University of Malang, Indonesia
Email Correspondent: sunaryo.2390711001@student.unud.ac.id

ABSTRACT

The objective of this research is to do a thorough analysis of papers that employ netnography, visual, and big data techniques within the domain of tourism. The netnography method, derived from ethnographic research, is employed to comprehend social interactions and user behavior on digital platforms. Visual analysis, in the meantime, centers on interpreting images and visual content produced by users. It employs a content-oriented approach to discover significant themes, including amusement, personal identity, and social interaction. Conversely, big data methodologies entail the gathering and examination of large volumes of data to discern significant patterns and trends within the food and tourism sector. This study also offers recommendations for future research, such as the advancement of more intricate analysis techniques and the promotion of interdisciplinary collaboration. The study discovered that netnography, visual, and big data techniques are successful in revealing consumer behavior in the context of food tourism. The combination of the three techniques yields a profound understanding of social interactions, visual depictions, and data patterns, and it proposes the advancement of more intricate analytical approaches for subsequent investigations. The results of this study are anticipated to offer enhanced comprehension for scholars and practitioners in comprehending intricate phenomena in the field of tourism.

Keywords: Netnographic; Visual; and Big Data; Food Tourism Research

Introduction

Technological advancements and the abundance of data are increasingly influencing tourism research in the current digital era. Innovative research methods, such as netnography, visual analysis, and big data, have emerged as effective approaches to understanding consumer behavior, trends, and patterns in the tourism industry. The advent of the digital era has revolutionized the field of tourism research by bringing novel approaches to comprehend the changing behaviors and markets of tourists. Netnography is a qualitative method that has been developed from classic ethnography to investigate user-generated content and digital footprints in online environments. It has proven to be beneficial in this regard (Kozinets & Gretzel, 2024). This technique provides valuable perspectives on dynamic tourist markets, emerging market expansion, and culturally unique segments (Wu & Pearce, 2014). In addition to netnography, the use of big data analytics that leverage mobile device signals, GPS, and social media data can offer a wider understanding of tourist behavior and assist in predicting travel demands. In addition to large-scale approaches, smaller data methods such as visual techniques, autoethnography, and qualitative GIS provide more detailed and contextual understanding of sustainable tourism dynamics. Combining big and small data approaches in tourism research can produce extensive and mutually supportive insights at many levels (Xu et al., 2020).

This literature review aims to explore and analyze the use of these three methods in food tourism research. Netnography, as a research method that focuses on online social interactions, enables researchers to understand the dynamics of digital communities and consumer behavior in the context of tourism. Meanwhile, the visual method provides insights into the visual representations generated by users, which can influence consumer perception and decision-making. On the other hand, the big data method offers the ability to collect and analyze data in large volumes, thereby uncovering previously unseen patterns and trends. In

this study, the author will evaluate each method's pros and cons and compare the three. Furthermore, this study will also provide recommendations for further research, with the hope of enriching the existing literature and contributing to the development of marketing strategies in the food tourism industry. Therefore, this literature review is expected to serve as a valuable reference for researchers, practitioners, and stakeholders in the field of tourism.

Methodology

The purpose of this research is to conduct a comprehensive examination of academic articles that utilize netnography, visual, and big data methodologies in the context of tourism. The netnography method, which is based on ethnographic research, is used to understand social interactions and user behavior on digital platforms. Visual analysis focuses on the interpretation of user-created images and visual content. The approach used is content-oriented, focusing on the identification of important topics such as entertainment, personal identity, and social interaction. In contrast, big data approaches involve gathering and analyzing substantial amounts of data to identify important patterns and trends in the food and tourist industries.

This study also provides suggestions for future research, including the development of more sophisticated analysis methods and the encouragement of interdisciplinary collaboration. This study's findings indicate that employing netnography, visual analysis, and big data methodologies is extremely advantageous for uncovering consumer behavior in the realm of food tourism. Combining the three methodologies enables a comprehensive understanding of social interactions, visual representations, and data patterns, highlighting the need for future research to develop more sophisticated analytical methods. The findings of this study are expected to provide a deep understanding for scholars and practitioners in comprehending complex phenomena in the sector of tourism.

Results and Discussion

This study presents an examination of articles that employ netnography, visual, and big data research methods. It subsequently provides an analysis of the interconnections among these three methods. Finally, the study offers conclusions and recommendations for future researchers interested in utilizing these discussed methods. The reviewed articles are from internationally recognized and respectable journals.

Netnography Method

The netnography method is described as a qualitative research strategy that use ethnographic methodologies to examine the culture and relationships inside the online environment. This methodology is employed to investigate the perception and handling of social media information by users, as well as the impact of digital communication on their attitudes and decision-making, particularly when it comes to purchasing a product or service. This study utilizes netnography to gather data from online interactions, including reviews and comments on social media platforms, in order to comprehend consumer behavior and motivations within the realm of culinary tourism. The researcher employs content analysis approaches to assess the symbolic content of the recorded conversations, alongside utilizing qualitative data analysis software like MAXQDA to aid in data analysis and interpretation. This approach offers comprehensive analysis of communication patterns within online communities, as well as the dynamics of user interaction and the sharing of gastronomic experiences. Netnography is a valuable tool for comprehending the social and cultural dynamics that arise from online interactions. It also aids in the creation of more focused marketing strategies in the culinary tourism sector.

Netnography is a form of ethnographic research that is conducted online, specifically an open and inductive method for the development of theories through qualitative data analysis, as defined by (Lee & Ko, 2022). Netnography is a valuable approach to the interpretation of online data generated by users and large datasets provided by online communities. Netnography is a research methodology that is employed to investigate the interpretation and management of social media information by followers, as well as the impact of communication on their attitudes and decision-making processes prior to purchasing a product or service (Ingrassia et al., 2022). Netnography is an ethnographic investigation of individuals' online interactions. It is a particular methodology that is used to define communication patterns and behaviors within groups and subgroups of online communities and cultures.

In this study, netnography is a qualitative research method that employs ethnographic research techniques to investigate the cultures and communities that emerge through internet communication, as per (Atsız et al., 2022). The netnography method employs conventional content analysis techniques to assess the symbolic content of all recorded communication. MAXQDA qualitative data analysis software is designed to facilitate the analysis and interpretation of data.

Jia (2020) employs netnography as a research method to investigate human behavior and interactions in online environments. In order to comprehend the motivations and contentment of customers from diverse cultural backgrounds, this investigation employs netnography to evaluate online reviews and ratings from restaurant patrons. The netnography procedure in this study entailed the collection of data from two distinct online review communities: Yelp and Dianping. The data was subsequently analyzed and processed using statistical techniques, latent Dirichlet allocation, and frequency analysis to identify patterns and differences in consumer reviews and ratings from China and the United States. The netnography method is one of the research strategies employed to acquire a comprehensive comprehension of the food experiences of Chinese independent travelers in Europe, as per (Cai et al., 2021).Concurrently with multi-sited ethnography, netnography was implemented, which encompassed participant observation, artifact collection, semi-structured interviews, and the observation of informants' online conduct. In the context of this investigation, netnography was implemented to monitor and document the online activities of informants during their vacations. This method provides a comprehensive and thorough understanding of the food tourism experiences of independent Chinese travelers.

Based on a critical analysis of the article (Lee & Ko, 2022), (Ingrassia et al., 2022), (Atsız et al., 2022), (Jia, 2020), (Cai et al., 2021) that utilized the method of netnography, it was found that the research overview of netnography focuses on the issue of online social interactions using digital data sources such as posts, chats, and interactions in online forums. Correspondence with informants is conducted through email, chat, and social media. The research conducted using the netnography method employs a qualitative approach with a post-positivist or naturalistic perspective to gather data from the web, digital applications, search engines, and social media. The data collected is further analyzed using content analysis, discourse analysis, and social construction techniques. Software for qualitative data analysis that can be used includes MAXQDA and Nvivo. A weakness of research that utilizes netnography as a method to gather data from online media is that it may not be able to produce highly representative data regarding the researched topic, as it does not encompass offline undocumented data, thus potentially not representing the population. The advantage of doing research using netnography method allows researchers to collect data online, which provides a broader understanding of consumer behavior. Furthermore, netnographic research provides comprehensive insights for food tourism stakeholders in developing operational and marketing strategies. The process of data collection is fast and efficient.

Visual Method

Visual methode as a research methodology that relies on images and visual features as the main source of data for analysis and interpretation in the field of culinary tourism. This approach entails a series of sequential actions, which encompass the gathering, categorization, and encoding of pictures that are pertinent to the subject of investigation. Researchers conduct a systematic analysis of photographs to find patterns, themes, and correlations, which helps to gain a more profound comprehension of visual representations in culinary tourism. Within the scope of this study, visual methods encompass the use of content analysis and semiotic analysis to comprehend the significance conveyed by visual components, such as food photos shared on social media. The objective of this study is to investigate the impact of these images on consumer perception and engagement. Furthermore, visual techniques might encompass the utilization of images as stimuli during interviews or focus groups to acquire supplementary viewpoints from participants. In summary, the visual techniques employed in this article highlight the significance of visual depictions in comprehending consumer behavior and its impact on culinary marketing. Additionally, these methods offer more extensive and profound insights into phenomena within the realm of culinary tourism.

The study strategy known as photo-based qualitative analysis method, as described by (Zelený et al., 2021), utilizes images as the main data source for analysis and interpretation. The process typically entails gathering images pertaining to a specific subject or research query, followed by methodical examination to acquire insight and comprehension. This approach frequently involves procedures such as arranging, encoding, and classifying photos in order to discern patterns, themes, and connections. Furthermore, it may entail using images as stimuli when conducting interviews or focus groups in order to obtain additional information and diverse viewpoints from participants. Qualitative photo-based analysis approaches enable researchers to investigate visual representations and capture various facets of the research issue that may be challenging to convey using conventional written data. Visual approaches, as defined by (Power, 2003), involve utilizing pictures, such as film, photography, and video, as instruments to enhance and enrich the process of generating knowledge in the subject of food sociology. These visual techniques enable academics to depict and convey knowledge in a more comprehensive and influential manner, while also fostering critical self-awareness in the examination of food and society. This visual methodology encompasses three primary research activities: generating visual representations, engaging in collaborative image creation with research participants, and analyzing pre-existing visual materials.

Liu et al., (2013) employed a visual analysis method using photographs in their study, employing a directed content approach. This methodology comprises three sequential stages: firstly, discerning primary classifications grounded in guiding theory; secondly, furnishing precise explanations for each classification; and finally, categorizing significant texts into distinct groupings. The Uses and Gratification (U&G) theory categorizes media use into four distinct categories: entertainment, personal identity, social connection, and information. However, the analysis revealed that only three distinct categories emerged as the primary themes: entertainment, personal identity, and social interaction. These themes demonstrate that internet food photography is popular due to people's fascination with food, as well as their desire for amusement, self-expression, and social engagement.

Visual approaches, as defined by (Michael & Fusté-Forné, 2022) involve employing content analysis and semiotic analysis to comprehend and decipher the visual components present in Instagram postings featuring luxury hotels in the United Arab Emirates. This technique is employed to ascertain and examine the explicit (literal) and implicit (implied) significances present in these visual components. Material analysis is employed to impartially

categorize various sorts of material, whereas semiotic analysis is utilized to decipher subjective significances associated with social and cultural contexts. This study seeks to comprehend how luxury hotels utilize visual methods to enhance gourmet experiences via photographs shared on social media.

According to the study conducted by (Takahashi et al., 2017), visual research approaches refer to studies that focus on developing techniques to assess the appeal of a food photograph. This approach entails extracting picture attributes from food photographs, with a specific emphasis on the visual characteristics of the primary ingredients as well as the overall perception of the meal image. This approach also uses a regression model to combine these visual characteristics and determine the overall appeal of a food photograph. This study additionally involves the creation of a publicly accessible food image library comprising ten distinct food categories. The experimental results confirm the efficacy of the suggested approach in combining both categories of visual characteristics.

Based on a critical analysis of the article (Zelený et al., 2021), (Power, 2003), (Liu et al., 2013), (Michael & Fusté-Forné, 2022), (Takahashi et al., 2017), the following article provides an overview of visual research that involves utilizing data sources in the form of photographs. It focuses on the analysis and interpretation of photo data, as well as the various components of visual research, including images, viewers, and creators. The visual research method is a qualitative research approach that focuses on images (visual objects) as the primary data source for analysis and interpretation. This method entails the systematic gathering, categorizing, and labeling of visual things that are relevant to a specific research subject. The visual items are thereafter subjected to a systematic analysis in order to discern patterns, themes, and relationships. This strategy enables researchers to investigate and understand the visual depictions contained within the visual objects. Furthermore, this approach can include the use of visual stimuli, such as objects, during interviews or focus groups to gather further information and diverse viewpoints from participants. The qualitative visual analysis method allows researchers to delve into and interpret visual data more thoroughly, resulting in a more extensive and profound understanding of the research issue.

Visual-based analysis approaches in research have inherent shortcomings and limitations, particularly subjectivity. This means that the interpretation of photographs might vary among individuals, as various people may see and analyze visual images in different ways. Subjectivity can lead to bias during the analysis process. The research report lacks information regarding the sample size of the visual objects evaluated, indicating a limited sample size. The limited sample size may restrict the capacity to apply the findings to a larger population. Researchers may lack complete control over the visual elements they collect due to their reliance on individuals or pre-existing databases in picture selection. The lack of control may result in fluctuations in the quality and pertinence of the visual elements. Visual objects have the potential to distort the truth or context of a culinary event or traditional dish. For instance, the chosen images or visual artifacts can fail to fully depict the magnitude of the invention or appropriately convey the opinions of the cooks and guests. Capacity for in-depth examinations is restricted. Although visual object-based qualitative analysis can offer extensive visual data, it may not thoroughly explore the underlying causes or motivations behind observed innovations or attitudes.

Supplementary qualitative methods, such as interviews or focus groups, may be necessary to enhance visual object-based analysis. Researchers must acknowledge and tackle these limitations in order to assure the accuracy and dependability of their findings. Despite the limitations of research conducted using visual analysis methods, there are also notable benefits. Specifically, the photo-based qualitative analysis approach employed in this study offers various advantages, such as facilitating a more profound exploration and comprehension of research themes by using visual data. Through the analysis of photographs,

researchers are able to capture and evaluate visual depictions that may not be readily discernible solely from conventional verbal data. Photo-based analytic approaches offer a more captivating and participatory approach to research. Participants can actively engage in the research process by capturing or supplying photographs, which can serve as stimuli for interviews or focus groups. By integrating visual and verbal data, this approach facilitates a comprehensive comprehension of the research subject. Furthermore, including photographs in qualitative research can improve the reliability and validity of the findings. Photographs contribute a level of impartiality and genuineness to the research process by providing visual proof. This facilitates data triangulation by enabling researchers to compare and validate information from images with other data sources. Moreover, photo-based analysis techniques can be very valuable in the domain of tourist research. It can be used by researchers to examine and analyze the visual elements of culinary events, such as classic dishes and creative presentations. This approach can offer valuable perspectives on the tastes and attitudes of both chefs and visitors towards culinary innovation, regionality/authenticity, and the overall attractiveness of a place. Qualitative photo-based analysis methodologies provide a distinct and efficient research strategy, allowing for a more profound comprehension of the research subject, heightened participant involvement, and improved credibility of the findings.

Big Data Method

The big data method in this article is a systematic approach to collecting, analyzing, and interpreting big data from multiple sources, especially in the context of food tourism. The procedure commences by gathering data from platforms such as TripAdvisor, where over 500,000 trip reviews are scrutinized. Subsequently, the gathered data is subjected to a process of cleansing in order to eliminate extraneous information. Analysis is conducted utilizing sophisticated methodologies such as machine learning and data mining to detect and comprehend patterns and trends. The approach also involved employing K-Mean Clustering to group the data and conducting sentiment analysis to provide insights into consumer preferences. This approach enables researchers to get a profound understanding of consumer behavior and motivations, facilitating the development of highly efficient marketing tactics in the culinary business. The use of big data techniques allows for a more comprehensive understanding of market dynamics and customer interactions in the digital age.

According to (Chakraborty et al., 2023) Research Methods for Big Data: The methodology of Big Data research refers to the approach used to collect, analyze, and interpret large amounts of data generated from many sources in order to get deep insights and understanding of a phenomenon or problem being studied. This method involves the utilization of sophisticated data analysis techniques, such as statistical modeling, machine learning, and data mining, to identify relevant patterns, trends, and relationships within the large dataset. The research method employed in this study utilizes a systematic approach to conduct a literature review on big data. This study uses the systematic literature review (SLR) method to gather, analyze, and organize findings from various relevant research articles on big data and the food industry. This method entails searching and exploring databases such as Google Scholar, Science Direct, Emerald Insight, and others with predetermined keywords. This study also included inclusion and exclusion criteria to choose relevant research articles. The results of this literature review are then analyzed and organized into relevant findings. This method provides a comprehensive understanding of the research topic, as well as identifies research gaps and future research directions.

According to (Mihuandayani et al., the Big Data research method is an approach used to collect, cleanse, analyze, and interpret extremely large and complex data to identify patterns, trends, and insights that may be used for better decision-making. The research

methodology for this study involves six steps within the framework of big data: data collection, data cleansing, feature extraction, clustering, ranking, and evaluation. The data is collected from social media, specifically Twitter, as well as from restaurant sales data. The data is subsequently cleansed to remove unnecessary symbols and information. The feature extraction method used is the "bag of words" technique to gather relevant information in the Indonesian language. Next, the clustering method employed is K-Mean Clustering to group food data based on certain clusters. The method used for ranking is Simple Additive Weighting (SAW) to determine the ranking of food based on user preferences. The accuracy of this algorithm was tested by comparing the predicted food trends with the sales data of several restaurants in Yogyakarta.

Chen et al. (2023) state that this study employs the big data research method to analyze and comprehend the vast amounts of data generated by foodstagrammers. The method organizes into steps, including the use of the Louvain network-based clustering algorithm to group images, the application of ANOVA and Dwass-Steel-Critchlow-Fligner pairwise comparison to gauge user engagement, and the use of sentiment analysis based on the text accompanying the images to understand user sentiment. This method enables researchers to identify the attributes and dimensions of gastronomy images, as well as understand users' preferences and emotions associated with these images. This study's research methodology for big data entails several systematic steps. First, the images are grouped using the Louvain network-based clustering algorithm. Next, the level of user engagement was calculated using one-way ANOVA analysis and pairwise comparisons with the Dwass-Steel-Critchlow-Fligner method. Next, sentiment analysis is performed based on the textual content posted together with the image using the Valence Aware Dictionary and Sentiment Reasoner algorithm. This method enables researchers to understand the attributes and dimensions of gastronomy images, as well as their influence on user engagement.

Marine-Roig et al. (2019) define the research method of big data as an approach that collects, manages, and analyzes large amounts of data (big data) to gain valuable insights and information. This method involves the use of algorithms as well as quantitative and qualitative analysis techniques to identify patterns, trends, and relationships within vast and intricate data. In this research, we employ the big data research method to gather and analyze over 500,000 online travel reviews (OTR) from the TripAdvisor website, with the aim of measuring their contribution to the destination's gastronomic image. This study employs a research methodology that gathers and analyzes data from over 500,000 online travel reviews (OTR) sourced from the TripAdvisor website between 2013 and 2017. An algorithm then processes the OTR data, generating a table of the most frequently occurring words. Quantitative and thematic content analysis is conducted to identify the cognitive and appraisive components of the gastronomy destination image.

Hasan et al. (2021) describe the Big Data research method as an approach that collects, analyzes, and comprehends large and complex amounts of data. This method involves the utilization of advanced technology and algorithms to process data obtained from various sources, including online platforms, sensors, and other devices. The objective of Big Data research methods is to identify patterns, trends, and insights that may be used to make better decisions and develop a deeper understanding of the phenomena being studied. This study employs a deep learning research methodology to analyze the digital consumer behavior in culinary tourism. This study gathered visual data from the Tripadvisor platform and utilized image analysis and clustering to understand the content consumers shared about their dining experiences at Chinese restaurants. Furthermore, this study used text mining techniques to analyze frequently occurring words in consumer responses. This method provides insights into consumer preferences, information needs, and motivations for sharing

reviews. This research contributes to the development of culinary marketing and expands the literature on visually generated, user-generated content in culinary tourism.

Based on a critical analysis of the article (Chakraborty et al., 2023), (Mihuandayani et al., 2018), (Chen et al., 2023), (Marine-Roig et al., 2019), (Hasan et al., 2021), The Big Data research overview is a methodological approach that involves the collection, analysis, and interpretation of large volumes of data from diverse sources. Its purpose is to provide valuable insights and a comprehensive understanding of a certain phenomenon or subject under investigation. This approach entails conducting searches and investigating databases such as Google Scholar, Science Direct, Emerald Insight, and other platforms, including social media, by utilizing preselected keywords. The techniques employed in Big Data research encompass database querying and exploration, keyword curation, and methodical examination of pertinent scholarly papers. These methodologies enable researchers to gather and analyze pertinent data in order to address the research inquiries presented. A limitation of Big Data research is its specificity, which restricts the generalizability of the findings. The constrained datasets utilized in the majority of research studies also pose a hindrance to generating more comprehensive and representative conclusions. Big Data research offers the advantage of providing a profound and thorough understanding of the topic under study due to the extensive and diversified volume of data collected. Another benefit is that the study of Big Data might uncover previously unseen patterns, trends, and linkages, enhancing comprehension of the subject under investigation. Furthermore, Big Data research has the potential to serve as the foundation for the creation of groundbreaking solutions across many disciplines including food tourism.

After discussing the netnography, visual, and big data methods, we can propose several recommendations for future research. These include identifying and addressing the method's limitations, as demonstrated in this study. For example, in the netnography method, researchers can consider combining online data with offline data to get a more comprehensive picture of the research topic. Also, in the visual method, researchers can expand the sample of photos analyzed to increase the generalizability of the findings. In the big data method, researchers can consider using more diverse data sources and expand the analysis to more in-depth dimensions. Second, by combining methods, future researchers can consider combining the netnoSecond, future researchers could consider combining the netnography method, visual method, and big data method in their research. standing of the phenomenon under study. For example, researchers can use netnography methods to collect online data, visual methods to analyze visual representations, and big data methods to analyze big data generated from online social interactions. Third, examining relevant topics, namely future researchers can continue this research by examining relevant topics in the context of Big Data and the food industry. For example, researchers can dig deeper into the use of Big Data in analyzing food trends based on social media or other online platforms.

This research can provide valuable insights for the food industry in developing better marketing and decision-making strategies. Fourth, developing more sophisticated analysis methods where future researchers can develop more sophisticated analysis methods in the context of Big Data. For example, researchers can use more complex machine learning or data mining techniques to identify deeper patterns, trends, and relationships in big data. Developing more sophisticated analytical methods can offer a more comprehensive and precise comprehension of the studied phenomenon. Fifth, conduct interdisciplinary research: Future researchers can incorporate cross-disciplinary collaboration into their research. For example, researchers may collaborate with statisticians, computer experts, or food industry experts to combine knowledge and skills from different fields in their research. Cross-disciplinary research can provide more comprehensive insights and innovative solutions for understanding complex phenomena. By following these suggestions, future researchers can

expand their knowledge and understanding of netnography methods, visual methods, and big data methods in the context of Big Data and the food tourism industry.

Conclusion

This study investigates the application of netnographic, visual, and big data techniques in food tourism research. The netnographic method is utilized to examine online social interactions and digital data produced by users, offering a more comprehensive comprehension of consumer behavior in food tourism. The visual technique provides a more profound understanding of visual representations in this particular context, whereas the big data method enables the gathering, examination, and interpretation of extensive datasets from diverse sources. The findings emphasize the importance of acknowledging and resolving these methodologies' constraints in order to guarantee the accuracy and dependability of research results. Furthermore, this study advances food tourism marketing tactics and broadens the existing body of literature on user-generated visual material in the field of food tourism. Incorporating netnographic, visual, and big data methods can yield a more comprehensive and nuanced comprehension of food tourism phenomena. This approach offers deeper insights and novel solutions for understanding consumer behavior, visual representation, and data patterns in the food tourism field.

Implications of the Study

The findings of this research have important implications for the food tourism business because they enhance our understanding of customer behavior by examining internet interactions. Industry players can adapt their marketing strategy and services by using netnography and big data methods to analyze consumer preferences. In addition, the examination of visual content posted by consumers enables firms to generate promotional materials that are more captivating and pertinent. This method enhances the utilization of data in decision-making and fosters innovative problem-solving through collaboration across different disciplines. This research paves the way for additional investigation in this subject, promoting more extensive research into the correlation between consumer behavior and food tourism.

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