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Unveiling Ubud's Gastronomic Image through Comparative Aspect-Based Sentiment Analysis as Cross-Platform Insights and Strategic SWOT Perspectives

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Abstract

Gastronomy is a strategic element in developing tourism destinations, and Ubud occupies a position as a cultural center that offers culinary riches of traditional value. This research reveals the gastronomic image of Ubud through a cross-platform analysis of TripAdvisor restaurant reviews and public opinion on sentiment labels at the micro level, implemented with VADER before fine-tuning aspect sentiment analysis (with BERT) to obtain a more granular representation. An in-depth analysis was conducted using wordcloud for cross-platform insights and SWOT recommendations. The research results show that the highest accuracy model evaluation results reached 98.87% for the term extraction aspect and 97.48% for the sentiment analysis aspect for TripAdvisor. Based on insight analysis, the food aspect is the main focus on both platforms, but with different narrative patterns: TripAdvisor emphasizes detailed evaluations such as taste, presentation, and service, while X is more oriented towards promotions, cultural identity, and participatory experiences, especially related to events such as the Ubud Food Festival. The integration of ABSA results into the SWOT framework resulted in four strategic findings: main strengths in the form of culinary authenticity, service quality, atmosphere, and experiential value; weaknesses related to inconsistencies in taste and chef quality; opportunities obtained from organizing festivals, street food, and culinary diversification; and threats in the form of overtourism and the perception of high prices. Overall, this study provides conceptual, methodological, and strategic contributions. The resulting findings strengthen the scientific basis for developing Ubud as a sustainable gastronomic destination that emphasizes taste, nature, and culture, as well as supporting data-based decision-making for tourism stakeholders.

Keywords: *BERT, Cross Platform ,Gastronomic, SWOT, Ubud.*

1. Introduction

In recent years, gastronomy has become a key element in developing sustainable tourism destinations [1]. Culinary tourism is no longer merely a travel companion but has evolved into a primary motivation for tourists to choose a destination [2]–[4]. Many cities worldwide are developing their gastronomic identities to attract tourists seeking authentic and culturally valuable experiences [5]. In this context, Ubud, as the cultural and spiritual center of Bali, has extraordinary potential to strengthen its position as a world-class gastronomic destination through the richness of its local cuisine, which is steeped in traditional and philosophical values. However, Ubud's gastronomic image is not formed solely by the quality of its cuisine but also by public perceptions that develop through various digital channels. In the era of social media, restaurant reviews and public opinions on platforms such as X (formerly Twitter) play a crucial role in shaping the reputation and expectations of tourists [6][7]. This perception is dynamic and influenced by personal experiences, global trends, and social issues such as sustainability and cultural authenticity. Therefore, a scientific approach that can analyze public opinion in depth is needed to understand how Ubud is gastronomically perceived across various digital platforms.

The Aspect-Based Sentiment Analysis (ABSA) method offers the ability to identify public sentiment at a more granular level than traditional sentiment analysis approaches [8]. With ABSA, opinions can be broken down into specific aspects, such as food quality, service, price, ambience, or authenticity, resulting in a more measurable picture of consumer perceptions. Through a comparative approach to restaurant reviews (which represent direct experiences) and X opinions (which reflect broader public discourse), this study seeks to uncover how Ubud's gastronomic image is formed from two distinct yet complementary sources of perception. Furthermore, the sentiment analysis results not only provide descriptive insights but can also be processed into a strategic framework through a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis. The integration of ABSA with SWOT allows this study to generate more applicable insights for destination development, particularly in the context of branding and managing sustainable gastronomic destinations. Thus, this study contributes to the academic realm of computational social science and tourism analytics and provides practical value for tourism and culinary stakeholders in Bali. Based on this background, this study aims to uncover Ubud's gastronomic image by comparing public

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sentiments and perceptions captured in restaurant reviews and opinions. The analysis is expected to identify key aspects that shape Ubud's SWOT as a global gastronomic destination. Using a data-driven approach and cross-platform comparative analysis, this study is expected to provide a scientific foundation for branding, promotion, and the development of an authentic, inclusive, and sustainable culinary ecosystem in the Ubud area.

This study significantly contributes to the development of sentiment analysis methodology and data-driven destination management by comparatively applying ABSA to restaurant reviews and opinions to uncover the multidimensional gastronomic image of Ubud. This approach not only strengthens the integration of computational linguistics, social media analytics, and destination branding studies but also provides a strategic foundation for managing and promoting gastronomic destinations. By identifying SWOTs from a public perspective, the results of this study can help stakeholders develop evidence-based promotional strategies that focus on culinary authenticity, service quality, or sustainability. Furthermore, these findings encourage the creation of a sustainable gastronomic destination model that highlights local culture, environmentally friendly practices, and community empowerment, thereby strengthening Ubud's position as an authentic and globally competitive gastronomic icon.

This study presents a conceptual novelty by examining Ubud's gastronomic image through a comparative approach across digital platforms, namely, between restaurant reviews (Tripadvisor) and X opinions. Most previous studies on gastronomic destinations still focus on descriptive analyses of single reviews from sites such as TripAdvisor or Google Reviews [9][10], while cross-platform research is still limited to non-tourism issues such as health or social crises [11]–[13]. By integrating both sources of perception, namely actual consumer experiences (reviews) and spontaneous public perception (X), this study offers a holistic understanding of how gastronomic images are formed and negotiated digitally. The context of Ubud as a destination that emphasizes the balance of culture, spirituality, and culinary also provides a new empirical contribution to the literature on gastronomy tourism in Southeast Asia, which has previously been dominated by studies from Europe and Latin America [14]–[18]. From a methodological perspective, this study\ applies the ABSA approach using Bidirectional Encoder Representations from Transformers (BERT) to fine-tune aspect extraction and aspect sentiment analysis. After identifying aspects, this study extracted aspect-opinion pairs (e.g., food–good, service–slow) using a sliding window approach. The opinions were sentiment-labeled using the VADER lexicon to obtain consistent polarity at the micro-level before fine-tuning for sentiment aspects, thus obtaining a more granular representation of the public opinion. This layered pipeline presents a methodological novelty compared to ABSA research that uses aspect extraction and aspect sentiment analysis alone [19]. The application of this model to the tourism and gastronomy domains strengthens the relevance of data-driven sentiment intelligence for culinary experience-based destinations while bridging the methodological gaps that have been identified in the literature regarding the application of ABSA in the tourism context. Furthermore, another novelty of this research is that it combines the results of the ABSA analysis into a strategic SWOT framework to derive applicable implications for developing gastronomic destinations. This hybrid approach is rarely applied because most previous research stops at the stage of interpreting sentiment without translating it into destination management strategies [20]–[22]. By linking the emotional dimension of the public to the strategic context of branding and tourism policy, this study opens a new paradigm for the integration of text analytics, tourism intelligence, and sustainable destination management. This ABSA–SWOT approach not only strengthens scientific contributions in the field of computational tourism analytics, but also provides a data-based strategic instrument for tourism actors, local governments, and culinary communities in formulating the direction of Ubud's development as an authentic, inclusive, and sustainable gastronomic destination.

2. Literature Review

Several studies that have used gastronomy tourism as a case study were conducted by [9], [23], [24]. Study [25] evaluated the use of Large Language Models (LLM) to classify review sentiments, representing tourism contexts such as cultural destinations, gastronomy, and accommodation (European castles, restaurants, and hotels), and to extract keywords with zero-shot. The results showed that the LLM can reliably classify sentiments in zero-shot scenarios and generate relevant keywords, thus offering a practical and efficient solution for tourism review analysis and supporting decision-making in the tourism sector. Study [24] assessed gastronomy tourism reviews of traditional restaurants in downtown Amman using a Cognitive, Affective, Conative (CAC) model with a machine learning approach. Google Reviews data were analyzed and showed that Random Forest performed best on the cognitive and conative dimensions, and Neural Network excelled on the affective dimension. Study [9] developed a hybrid sentiment analysis framework for gastronomic tourism reviews in Sarawak by combining lexicon approaches, emotion analysis, and machine learning classification methods. This study addressed sentiment class imbalance through synonym-based data augmentation and n-gram feature engineering, and tested various ML models (SVM, RF, KNN, CNN, LSTM, and CNN-LSTM). Experimental results showed that the combination of data augmentation and n-grams in the KNN model provided the best performance, achieving an accuracy of 0.98 and an F1-score and ROC-AUC of 0.99, particularly in improving minority class prediction. In addition, business dashboard-based visualization helped map tourist perceptions, with the finding that more than 80% of reviews showed positive sentiment from both lexical and emotion analyses.

In addition, several studies have implemented ABSA in tourism contexts, such as hotels [26], [27]. A study [27] implemented ABSA on hotel reviews by integrating word sense disambiguation (WSD), BERT, and Graph Convolutional Networks (GCN). This study used Booking and TripAdvisor reviews, disambiguating word sense using WordNet and BERT embedding, and then modeling the relationship between aspects through a GCN-based graph structure and BiLSTM. Experimental results showed that the integration of WSD significantly improved the accuracy of sentiment classification at the aspect level, surpassing various previous results. Study [26] analyzed online customer reviews of ten hotels offering high-tech services and products through ABSA. The analysis results identified various aspects that influence guest satisfaction, namely, location, room amenities, cleanliness, customer support, food/drinks, design, staff, facilities, payment, view, high technology, and value. This study confirms that the technology aspect (“High & Tech”) emerged as a significant new aspect in ABSA, indicating that guests pay particular attention to technology-based innovation.

3. Methods

Figure 1 shows the research stages leading up to the cross-platform insight and SWOT analyses of Ubud gastronomy. The research began with data collection, followed by aspect compilation and tagging. The model was then fine-tuned to predict aspect terms, opinions were extracted and lexicon labeling. A second fine-tuning was conducted to predict aspect sentiment. The prediction results were evaluated through word-cloud across platforms and finalized with a SWOT analysis to guide the sustainable development of Ubud gastronomy.

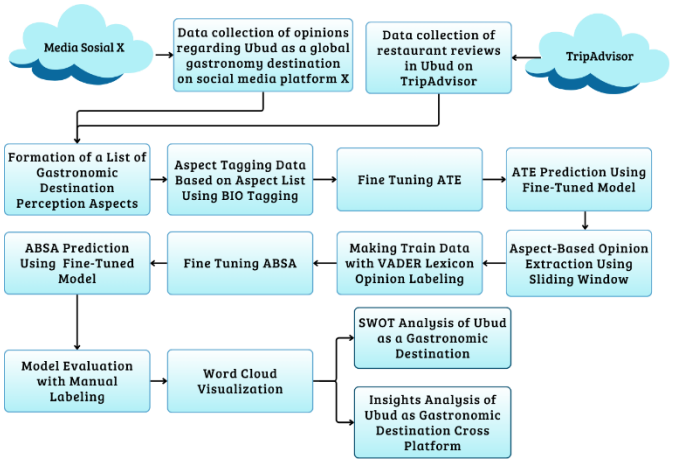


Fig 1. Research Stages

This study used two platforms: TripAdvisor (restaurant) and X (opinions) on Ubud gastronomy in English. The data taken is a 10-year span, TripAdvisor from to 2011-2021 and X from to 2015-2025, where restaurant review data are scraped using Selenium, while X opinion data are taken using Tweet Harvest. The list of restaurants was taken from the Provincial Tourism Office directory (970 restaurants), while X data were taken based on keywords related to Ubud, food, and gastronomy, as shown in Table 1.

Table 1. Keyword for X Scrapping

Keywords						
Ubud Food Taste	Ubud Hygiene Standards	Ubud Food Waste Awareness	Ubud Walkability	Ubud Food Tourism	Ubud Instafood	Ubud Vegan Vegetarian Options
Ubud Food Variety	Ubud Food Stalls	Ubud Eco-Friendly Packaging	Ubud Online Reviews	Ubud Authentic Food	Ubud Food Journey	Ubud Organic Food
Ubud Authenticity	Ubud Cafe Culture	Ubud Support For Local Farmers	Ubud Food Delivery Availability	Ubud Best Food	Ubud Food Recommendation	Ubud Location Of Restaurants
Ubud Freshness	Ubud Ambience Of Eateries	Ubud Traditional Cooking Methods	Ubud Transportation To Culinary Spots	Ubud Culinary Art	Ubud Food Rating	Ubud Travel
Ubud Ingredients	Ubud Service Quality	Ubud Food Festival	Ubud International Recognition	Ubud Culinary Destination	Ubud Food Spots	Ubud Food Trends
Ubud Plating Presentation	Ubud Staff Hospitality	Ubud Cooking Classes	Ubud Food Bloggers Reviews	Ubud Food	Ubud Gastronomy	
Ubud Traditional Recipes	Ubud Waiting Time	Ubud Farm-To-Table Tours	Ubud Media Mentions	Ubud Food Aesthetic	Ubud Local Cuisine	
Ubud Local Flavors	Ubud Booking Convenience	Ubud Culinary Workshops	Ubud Awards Or Nominations	Ubud Food Culture	Ubud Food Tradition	
Ubud Restaurant Availability	Ubud Customer Satisfaction	Ubud Tasting Experiences	Ubud Destination Branding	Ubud Food Destination	Ubud Food Quality	
Ubud Fine Dining Options	Ubud Pricing Transparency	Ubud Food Markets	Ubud Food Hunting	Ubud Food Experience	Ubud Food Review	
Ubud Street Food	Ubud Local Sourcing	Ubud Signage In English	Food Lovers Ubud	Ubud Food Guide	Ubud Food Tour	

The TripAdvisor data consisted of 24,060 rows, and the X data consisted of 6,239 rows, resulting in a total of 30,299 rows. The data were then cleaned and preprocessed. Data cleaning involved removing missing values and duplicates. Text preprocessing included case folding, punctuation removal, text cleaning (URL, emoji, character, number, and whitespace), tokenization, stopword removal, and lemmatization. Cleaning and text preprocessing resulted in 3,247 rows for the X data and 23,646 rows for the TripAdvisor data.

ABSA consists of two stages: aspect term extraction (ATE) and aspect term sentiment analysis (ATSA) [28]. This study used a pre-trained BERT (bert-base-uncased), which implements fine-tuning for specific tasks, namely, ATE and ATSA. BERT is a pretrained transformer-based method with a bidirectional attention concept that captures the contextual relationships between words from both directions (left and right) within a sentence [29]. BERT can provide contextual information that adapts word meaning based on its use in a sentence, compared to other traditional word embedding models [30]. This study used a list of 1,443 aspects related to Ubud as a gastronomic destination to develop the questionnaire. This list was tagged using the Begin, Inside, Outside (BIO) tagging to determine the position of the aspect in the text. B or B-ASP (beginning of aspect) indicates the first word in the aspect, I-ASP (inside of aspect) is the next word in the same aspect, and O is not part of the aspect. Based on the tagging results, ATE fine-tuning was performed before making predictions.

Before fine-tuning ATSA, this study did not directly use aspects but rather opinion sentences explaining the aspect. For example, if the aspect "taste" is related to the words "delicious" or "good," then the opinion sentence becomes "good taste" or "delicious taste." This study used a sliding window technique to extract opinions. This technique involves extracting tokens to the left and right of the aspect in a sequence of three tokens. From the collected tokens, Part of Speech (POS) tagging was performed to detect adjectives (adj) or verbs. When an ajd/verb is found, that token is determined as the boundary of the opinion sentence, that is, from the opinion boundary to the aspect token if found on the left, and from the aspect token to the opinion boundary if found on the right. If the adj/verb is adjacent to the right/left of an aspect, the opinion is taken from the left, assuming that the right opinion boundary belongs to the next aspect. This is done to avoid opinions being used for different adjacent aspects. For example, "good atmosphere, friendly staff, food is also good," with the aspects "atmosphere," "staff," and "food," results in the opinion sentences becoming "good atmosphere," "friendly staff," and "food is also good." The obtained opinion sentences were then labeled. Because manual labeling is prone to errors and is time-consuming, this study implemented automatic lexicon-based labeling without training using the VADER Lexicon. VADER works by assigning scores to words

(-1 to 1) and combining them into a compound score that becomes the sentiment label for each text [31]. The labeling results were then used for ABSA fine-tuning, and the model results were used for ABSA prediction. The evaluations used to demonstrate the model's capabilities included accuracy, precision, recall, and f1-score, and loss (for the fine-tuning model). Cross-platform insights and SWOT analysis were analyzed using bigram and trigram word cloud visualizations that show the frequency of two- and three-word sequences that frequently appear in the dataset. The larger the data size, the more frequently words appear.

3. Result and Discussion

3.1. Model Evaluation

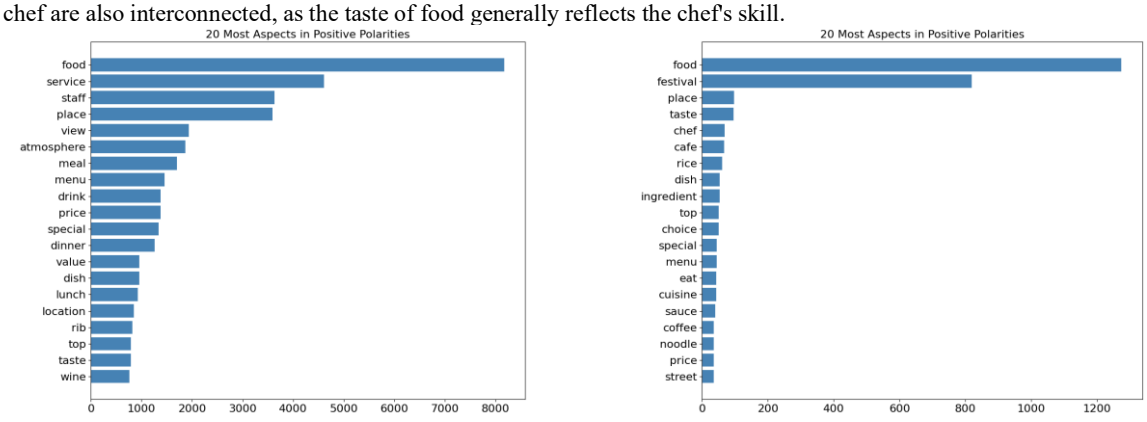
The evaluation results for fine-tuning the ATE and ATSA are shown in Table 2. Overall, the evaluation of both Tripadvisor and X showed good results above 90%. The highest accuracy was shown in Tripadvisor, reaching ATE 98.87% and ATSA 97.48%. The F1-score measure also showed balanced results between the recall and precision. The X data showed a lower evaluation because the amount of Tripadvisor data was more than X; thus, the more data, the better the learning model. In addition, Tripadvisor shows discussions in the same domain, such as culinary experiences in restaurants, while X shows more diverse discussions; therefore, the model for Tripadvisor can better recognize text.

Table 2. Evaluation of Fine Tuning ATE and ATSA

Data	Model	Accuracy	Precision	Recall	F1-Score	Loss
X	ATE	98,87%	95,01%	95,12%	95,06%	4,87%
	ATSA	97,49%	97,43%	97,49%	97,45%	11,69%
Restaurant	ATE	99,85%	99,52%	99,65%	99,58%	0,68%
	ATSA	99,64%	99,64%	99,64%	99,64%	2,32%

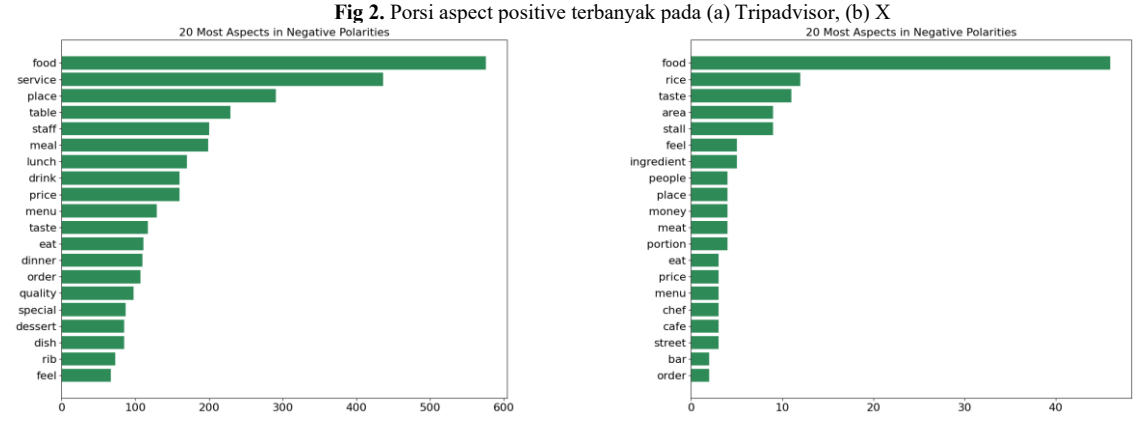
3.2. Cross-Platform Opinion Insights

The experimental results revealed that popular aspects had the highest number of sentiments. A comparison of the number of sentiments with positive and negative aspects in restaurant reviews on TripAdvisor and opinions on X is shown in Figure 2 and 3. For positive sentiment, food was the most frequently mentioned aspect on both TripAdvisor and X, followed by service, staff, place, and view. Service and staff are generally closely related; good service is usually supported by friendly and responsive staff members. Similarly, place and view are closely related, as attractive places often offer beautiful views. Meanwhile, on X, food was followed by festival, place, taste and chef. This can be attributed to the annual Ubud Food Festival, which allows many tourists to express their perceptions through X. Taste and chef are also interconnected, as the taste of food generally reflects the chef's skill.



(a) (b)

Fig 2. Porsi aspect positive terbanyak pada (a) Tripadvisor, (b) X



(a) (b)

Fig 3. Porsi aspect negative terbanyak pada (a) Tripadvisor, (b) X

For negative sentiment, food remained the most dominant aspect on TripAdvisor and X. This indicates that food is the primary factor that most often causes tourist disappointment. On TripAdvisor, food was followed by service, place, table, and staff. The relationship between service and staff is again evident, where unsatisfactory service is often caused by staff behavior or responses that do not meet customer expectations. Furthermore, the place and table aspects reflect visitors' experiences with the comfort of the place and table arrangement in the restaurant. Meanwhile, at X, the food aspect is followed by rice, taste, area and stall. The dominance of rice and taste indicates that

tourist dissatisfaction at X is often related to the taste and quality of local food ingredients. The area and stall aspects also indicate complaints about the location and condition of the dining area, such as cleanliness, comfort, and crowds around the culinary area.

Based on a comparison of ten aspects between TripAdvisor and X, significant differences were found in how tourists expressed their perceptions of culinary experiences in Ubud. In general, TripAdvisor tended to favor reviews that evaluated direct qualities, such as taste, presentation, service, and restaurant atmosphere. Meanwhile, X was more dominant in conveying perceptions that emphasized promotional nuances, local identity, and participatory experiences related to events and culinary exploration. A comprehensive analysis of these differences is presented in Table 3. For example, in terms of food, both TripAdvisor and X shared a primary focus on tourists. However, on TripAdvisor, the emphasis was more on taste and presentation, as seen in phrases like "amazing-food" and "beautifully-presented-food." On the other hand, on X, terms that emerged tended to relate food to the context of events or lifestyles, such as "ubud-food-festival" and "vegan-food." This suggests that X functions more as a platform to highlight culinary narratives as part of a cultural experience.

Aspects such as place, atmosphere, and café on TripAdvisor are often used to provide direct assessments of the comfort and beauty or aesthetics of a place, while on X these aspects are often associated with the experience of exploring culinary locations and lifestyle trends, for example through phrases such as “best-place-eat” or “vegan-friendly-café.” This shows that travelers on TripAdvisor play a more evaluative role, while on X, they play a more storytelling and promotional role. There are also striking differences in the aspects of chef, menu, ingredient, and cuisine. TripAdvisor tends to praise the skill and quality of presentation, such as “talented-chef” or “excellent-menu,” while X predominantly emphasizes local and cultural values, such as “local-ingredient,” “Balinese-cuisine,” and “celebrate-Indonesian-cuisine.” This pattern confirms that X users more often associate culinary arts with cultural identity and tourism promotion rather than simply taste assessments. Overall, these results indicate that TripAdvisor reflects the personal experience of travelers, while X is more of a means for tourists to explore, promote, and take pride in local cuisine. The differences in insights in Table 3 are the results of a study on the related aspect word clouds of the ABSA model. The following word clouds of several aspects are shown in Figures 4–7. We realize that due to the limitations of the presentation in this article, the complete word cloud can be accessed at [32].

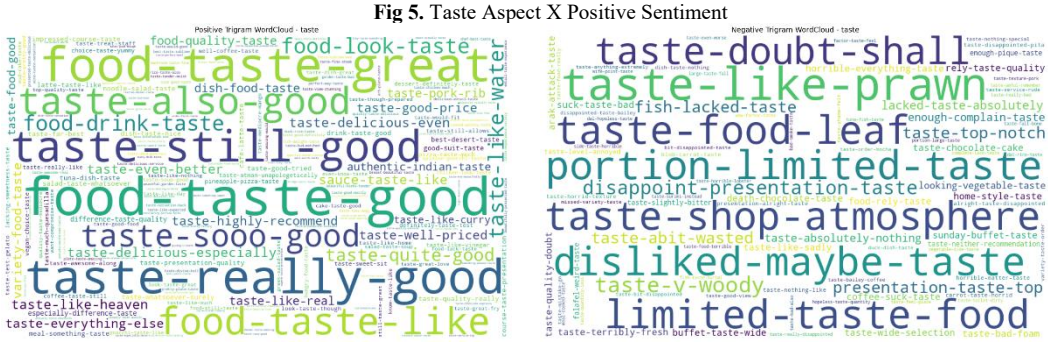
Table 3. Comparative Insights between TripAdvisor and X

Aspect	Insight TripAdvisor	Insight X
Food	It focuses on assessing the taste, presentation, and quality of food. Seen in "amazing-food," "food-absolutely-delicious," "food-beautifully-presented," and "food-a-bit-dissapointing."	The focus was on the context of the event, location, and type of food. Seen in "ubud-food-festival," "healthy-food," "vegan-food," and "food-stall."
Place	Dominant in general assessments of place quality and recommendations, such as "place-looks-nice," "place-highly-recommend," "place-well-worth," and "worst-place."	More related to culinary activities or the experience of exploring dining venues, such as "best-place-eat," "place-embark-adventure," "guided-best-place," and "cuisine-best-embark."
Taste	More focused on the taste assessment itself, such as "taste-good," "bad-taste," "taste-soo-good."	More emphasizing the exploration of authentic flavors and experiences at food events, such as "festival-taste," "taste-creation," "bring-taste-indonesia," "enjoy-taste-adventure," and "thicker-stronger-taste."
Chef	Indicates perceptions of the chef's ability and expertise, such as "talented-chef," "prepared-chef," "nice-chef," "chef-genius-great."	More indicative of the chef's identity and role within the event context, such as "local-chef," "best-pastry-chef," "festival-chef," "scottish-chef," and "chef-culinary-icon."
Café	More focused on assessing the cafe itself, covering perceptions of names like"clear-café," "café-wayan," "café-lovely," "best-restaurant-café," and “café-wayan-highlight”	More indicative of tourist perceptions for promoting cafe destinations and trends, such as "work-friendly-ubud," "best-café-ubud." “vegan-friendly-café,” “café-healthy-breakfast,” and “guide-awesome-coffee”
Atmosphere	Indicates a general assessment of the atmosphere, such as “great atmosphere,” “good atmosphere,” “relaxed atmosphere,” and “disappointed atmosphere.”	Not only do they assess the general atmosphere, but they also describe a specific vibe or nuance, such as “calm-warm-atmosphere,” “romantic-luxurious-atmosphere,” and “warm-atmosphere-night.”
Rice	Predominantly focused on views and taste quality, such as “view-rice-field,” “rice-paddy-great,” “fried-rice,” “spice-rice,” “fresh-rice,” and “black-rice.”	These ratings are predominantly based on rice dishes, although there are also ratings for views, such as “donburi-rice,” “warm-rice,” “hot-rice-cake,” “rice-bowl,” and “nuance-rice-field.”
Ingredient	Mainly centers on ingredients, such as “fresh-ingredient,” “good-quality-ingredient,” “natural-ingredient,” “good-indication-ingredient,” “healthy-eating-ingredient.”	They are predominantly based on origins, learning, and local ingredients, such as “local-ingredient,” “learn-ingredient,” “organic-ingredient,” “adventure-learn-ingredient,” and heavily emphasize the word “local.”
Menu	Assessment of the restaurant's menu, such as “huge-menu,” “excellent-menu,” “interesting-menu,” “limited-menu,” “lot-choice-menu,” “menu-highly-recommend,” “wine-menu-presentation,” “disappointed-cocktail-menu”	The ratings emphasize the type of menu offered and recommendations for specific dishes, such as “mediterranean-menu,” “menu-champion-local,” “recommended-menu.” "selling-menu-creamy", "best-menu-meat", "udon-menu-delicious", "meny-day-pizza", "menu-fuse-mexican"
Cuisine	Direct assessment of culinary quality and experience, such as taste, presentation, and overall impression of the dish. Reflected in phrases like "fine-cuisine", "great-cuisine", "fusion-cuisine", and "delicious-cuisine", as well as "Indian-cuisine"	Showcases local culinary identity, particularly Indonesian cuisine, like "indonesian-cuisine", "local-cuisine", "balinese-cuisine", "nusantara-cuisine", "true-cuisine-place", "promotes-indonesian-cuisine", "celebrate-indonesian-cuisine", and "source-true-cuisine".

(a) (b)

Fig 4 Food Aspect TripAdvisor (a) Positive Sentiment, (b) Negative Sentiment

Fig 5. Taste Aspect X Positive Sentiment



(a) (b)

Fig 6. Taste Aspect TripAdvisor (a) Positive Sentiment, (b) Negative Sentiment

3.3. SWOT Analysis

Table 5 shows a comparison of each aspect, the dominant sentiment across both platforms, or just one of them. Furthermore, the dominant sentiment on Tripadvisor is greater than that on X. This difference may be due to the fundamental nature of two different forms of digital communication between TripAdvisor restaurant reviews and opinions on the structure of the review platform, which provides dedicated columns for each category, reinforcing this tendency and resulting in lengthy, information-dense texts with high textual density and semantic coherence. In contrast, opinions on X are spontaneous, situational, and social, highlighting emotions, general opinions, or symbolic imagery rather than detailed evaluations. The character limits and fast-paced nature of the conversation make expressions on X more concise and fragmented, focusing on conceptual issues such as reputation, trends, and cultural values. As a result, discussions of direct experience are more dominant on Tripadvisor, while on X, they emerge as a macro discourse that reflects Ubud's collective perceptions as a gastronomic destination. Based on the comparison, insights for SWOT analysis can be obtained, as shown in Table 6.

Table 4. Comparison of Key Aspects

Aspect	Positive Sentiment%	Negative Sentiment%	Dominant Platform	Example Keywords
Food	94%	6%	Restaurant	"great", "delicious", "worst", "tasty", "beautifully"
Place	93%	7%	Restaurant	"lovely", "nice", "perfect", "worth"
Taste	87%	13%	Restaurant	"delicious", "great", "excellent", "authentic", "dissapointed", "bad", "horrible"
Chef	88%	12%	Restaurant	"talented", "special", "prepared", "shy", "lazy"
Cafe	93%	7%	Restaurant	"lovely", "clear", "beautiful", "clean",
Atmosphere	98%	2%	Restaurant	"relaxed", "romantic", "good", "great"
Rice	94%	6%	Restaurant	"paddy", "field", "pudding", "terrace", "lovely", "warm" "fried"
Ingredient	93%	7%	Restaurant	"fresh", "quality", "natural",
Cuisine	89%	11%	Restaurant	"fine", "great", "indian", "healthy",
Service	92%	8%	Restaurant	"excellent", "friendly", "top-notch", "good", "great"
Staff	95%	5%	Restaurant	"friendly", "helpful", "welcoming", "super", "attentive"
View	97%	3%	Restaurant	"stunning", "beautiful", "dissapointed", "rice field", "rice paddy", "river", "lower level",
Price	90%	10%	Restaurant	"reasonable", "good", "fair", "worth", "excelent", "low", "bad"
Value	99%	1%	Restaurant	"money", "great", "excellent", "better", "amazing"
Location	97%	3%	Restaurant	"good", "beautiful", "perfect", "amazing", "stunning", "well worth", "great ambiance"
Festival	100%	0%	Tweet	"ubud food", "presented", "brilliant line"
Table	76%	24%	Restaurant	"nice", "best", "good", "low", "empty", "dirty", "chair low",
Street	91%	9%	Tweet	"delicious street food", "top", "like", "amazing", "local"
People	88%	12%	Restaurant	"friendly", "interesting", "lovely", "complain", "noisy", "well traditional", "great group", "crowd"

Table 5. SWOT Analysis Based on Aspects

Aspects Identified	Cross-Platform Sentiment Insights	Interpretation	Strategic Implications for Ubud Gastronomy
		Strenghs	
Food	Positive sentiment is quite high in the restaurant data (94%), with the most frequent mentions being "really good food," "absolutely delicious food," and "beautifully presented food." Positive sentiment was also quite strong for X (92%), with the phrases "ubud-food-	Ubud food has a positive impression among tourists because of its deliciousness, authenticity, and presentation. Tourists also highly value the variety of dishes, such as vegetarian, organic, and healthy options. Furthermore, the Ubud Food Festival	Maintaining authentic flavors is a core element of Ubud's gastronomic branding, which is strengthened by healthy and organic food destinations for sustainable gastronomy. The Ubud Food Festival can also be a platform for promoting these authentic flavors.

	festival," "vegan-food," "healthy-food," and "organic-food" frequently mentioned.	provides a memorable experience for tourists.	
Place	Positive sentiment was dominant in the restaurant (93%) and strong sentiment for X (96%). The dominant phrases, such as "lovely place," "well-worth place," "definitely recommended place," and in X, "favorite place," "cuisine-place-embark," "best-place-bali," "place-embark-adventure," "guide-best-place."	The dining scene in Ubud is highly recommended and worth visiting. Ubud has various dining establishments where tourists can embark on culinary adventures.	Strengthen Ubud's position as a gastronomic adventure that combines taste and experience. For example, businesses can develop a culinary map connecting top dining establishments to promote Ubud as a culinary journey experience.
Cafe	Positive sentiment is strong for restaurant (93%) and X (95%), where restaurant has a higher number of opinions such as "clear café," "lovely café," "clean café," and X frequently mentions "café-healthy-breakfast," and "work-friendly-café."	This demonstrates that cafes are also a memorable experience for tourists. Clean cafes are a key focus for tourists, and cafes that are popular in Ubud are work-friendly and serve healthy food. This emphasizes that cafés are not just places to relax or socialize, but also places of productivity.	Maintaining cleanliness and hygiene in cafes is a top priority. Strategies can include promoting employee-friendly cafés with healthy local menus to attract digital nomads and wellness travelers.
Atmosphere	Strong sentiment was demonstrated on both platforms: restaurant (98%) highlighted "relaxed atmosphere," "romantic atmosphere," and emphasis on "good," "great," and "amazing." X (100%) highlighted "warm atmosphere," "comfortable atmosphere," and emphasis on "nice," "pleasant," and "perfect."	This demonstrates that tourists experience a very comfortable, calm, and even romantic atmosphere while enjoying culinary delights in Ubud. This aspect can be a key element in strengthening the dining experience, which aligns with Ubud's serene and natural image.	Maintaining and highlighting Ubud's distinctive atmosphere in its gastronomic marketing strategy. Businesses can develop dining concepts with natural settings or open-air designs, natural lighting, and Balinese cultural elements to maintain an authentic, distinctive, and relaxing atmosphere.
Ingredient	Positive sentiment was quite strong on both platforms (restaurant 93%, X 91%), with many mentioning fresh, high-quality ingredients sourced from local farmers, with an emphasis on "good," and "wholesome."	This demonstrates that tourists highly value fresh, local, and natural culinary ingredients in their dining experiences. This may reflect tourists' awareness and preference for the sustainability and authenticity of Ubud cuisine.	Maintaining natural and high-quality local ingredients is the core of Ubud's culinary identity. Strategies could include collaboration between restaurants and local farming communities and promoting eco-gastronomy experiences to provide fresh culinary experiences and ethical values in Ubud's signature ingredients.
Service	Strong positive sentiment regarding restaurant service (92%) featured phrases like "excellent service," "top-notch service," "friendly service," "great service staff," and emphasis on "good," and "great," indicating that travelers appreciate good and friendly service.	Friendly, prompt, and attentive service is an essential element of the culinary experience in Ubud. Tourists feel comfortable and trustful due to positive interactions with warm and courteous staff.	Maintain excellent service standards based on Balinese hospitality. Strategies could include ongoing staff training to reinforce service excellence and improve slow services.
Staff	Good positive sentiment at restaurant (95%) showed a dominant phrase, "friendly staff." "helpful-staff," "welcoming-staff." Tourists consistently rated their interactions with the staff as an important part of their dining experience.	This aligns with the service aspect, where the friendliness and professionalism of the staff can reinforce Ubud's positive image as a warm and welcoming culinary destination.	Maintain excellent service standards by strengthening staff interpersonal competencies through ongoing training in communication, complaint management, and ethical service. Strategies should also include a reward system for outstanding staff and firm policies against unprofessional behavior.
View	Strong positive sentiment in restaurants (97%) frequently mentioned "rice-field view," "rice-paddy view," "amazing-river view," "beautiful-view," and "stunning-view." Tourists expressed high appreciation for dining experiences accompanied by the unique natural panoramas of Ubud.	Ubud's natural scenery, such as rice fields, valleys, and rivers, provides aesthetic and emotional value that enriches the culinary experience of tourists. The "view" element reinforces Ubud's image as a gastronomic destination in harmony with the nature and local culture.	Strengthen Ubud's image as a "dining with a view destination" by preserving the natural beauty of the surrounding culinary region. Strategies could include promoting culinary packages based on natural scenery (such as sunset dining or rice terrace lunch experiences), adjusting restaurant layouts to harmonize with the environment, and preserving rice paddy and river views as sustainable-tourism assets.
Value	Positive sentiment was prevalent in restaurants (99%), such as "great-value," "price-value-money," "excellent-value," "good-value-quality," and "menu-great-value." There were almost no complaints regarding the price or cost of meals.	Tourists consider the prices of food and services in Ubud to be commensurate with the quality of taste, ambiance, and service received. This reinforces Ubud's perception as a culinary destination with an ideal balance between premium quality and reasonable prices.	Maintain a reputation for "high quality, fair price" through price transparency, consistent quality, and innovative value-added menu items. Strategies could include promoting value-based culinary packages or affordable fine dining to reach a wider tourist segment while strengthening customer loyalty and a positive image of Ubud's gastronomic destination.
Location	Both restaurant (97%) and X (92%) show strong positive sentiment, like "beautiful-location," "great-ambience-location," "really-great-location,", emphasis location appreciation, like "good," "perfect," and "well worth." Tourists valued the area's beauty, accessibility, and ambiance	Restaurants in Ubud are strategically located and have high aesthetic appeal, often blending with natural scenery or a distinctive rural atmosphere. This enhances the culinary experience as part of the exploration of Ubud.	Maintaining location advantage by balancing accessibility and environmental sustainability. Strategies could include developing geo-based culinary mapping, promoting "culinary destination clusters" in areas with iconic views, and aligning restaurant layouts with Ubud's natural and cultural identities.
Rice	Positive sentiment is quite strong in restaurant data (94%) but quite low in X (83%). The restaurant shows "beautiful-rice", "rice-paddy", rice-good", "rice-terrace", "black-rice", "lovely-view-rice",	Rice and the rice paddy landscape are authentic symbols of the Ubud culinary experience. Visitors not only enjoy rice-based dishes but also associate them with a rural atmosphere and distinctive rice paddy	Reinforcing Ubud's "rice-based gastronomy" as a signature culinary identity can be achieved by promoting the "from paddy to plate" concept, featuring rice-based dishes in gastronomy festivals, and preserving rice fields as part of the culinary landscape. Strengthening collaboration

	"heat-rice-cake", "warm-rice", "donburi-rice-bowl", "natural-nuance-rice"	views, strengthening the connection between cuisine and nature.	between restaurants and local farmers can further build a sustainable gastronomy narrative.
		Strength & Opportunities	
Festival	Strong positive sentiment in X (100%) was demonstrated by the phrases "ubud-food-festival," "food-festival-presented," "food-festival-delicious," "festival-back," and "festival-promotes." This demonstrates public enthusiasm and the excellent reputation of this iconic event.	The Ubud Food Festival is a major force in promoting local cuisine and strengthening Ubud's image as a global gastronomic hub. It also provides a platform to broaden international networks, support culinary MSMEs, and raise awareness of the cultural values and sustainability of local foods.	Utilizing the Ubud Food Festival as a key platform for culinary branding and collaboration among stakeholders (chefs, farmers, MSMEs, and tourists).
		Strength & Weaknesses	
Taste	Positive sentiment was quite high in restaurant reviews (87%) and X (90%), with dominant phrases such as "delicious-taste," "bring-taste-Indonesia," and "thicker-stronger-taste." However, several complaints, such as "horrible taste," emerged, indicating inconsistencies in the taste experience.	While the majority of tourists enjoy Ubud's culinary delights, there are differences in taste preferences between local and international tourists. Inconsistencies in taste standards across restaurants can impact the perception of the authenticity and quality of Ubud's gastronomy.	Standardization of flavors and adaptive menu innovation are necessary to maintain the authenticity of Balinese cuisine. Strategies could include training chefs and culinary professionals to balance authentic local flavors with global palates, as well as educational promotions that highlight Bali's distinctive taste philosophy to enhance international tourism acceptance.
Chef	Positive sentiment was strong in restaurant (88%) and X (91%), with phrases such as "talented-chef," "creative-chef," "local-chef," and "chef-genius-great." However, complaints like, "lazy-chef" and "shy-chef," emerged, indicating differences in tourists' perceptions of service quality and chef involvement.	Tourists recognize the expertise of Ubud's chefs, particularly in terms of the creativity and uniqueness of their culinary offerings. However, there are indications that a few restaurants have chefs who lack interaction or professionalism. This disparity in quality between restaurants can impact the overall reputation of gastronomic destinations.	Professional training programs and certifications for local chefs are needed, including strengthening culinary hospitality and presentation skills to boost tourist confidence. Furthermore, promoting local chef branding can strengthen Ubud's narrative as a culinary hub based on creative local talent that meets international standards.
		Weaknesses	
Table	Positive sentiment was the lowest compared to other aspects (76%) in restaurant review data, with phrases like "great table," "best table," but also numerous complaints such as "low table," "dirty table," "shaken table," and "disappointed table."	Tourists perceive physical aspects such as table height, cleanliness, and seating comfort as not fully meeting their expectations. These factors directly impact the dining experience, especially in restaurants with limited capacity or less ergonomic layout.	Improvements in cleanliness, comfort, and restaurant design in Ubud are needed. Local governments or tourism associations can issue guidelines for restaurant design and hygiene standards and conduct regular hygiene audits. Furthermore, businesses need to pay attention to simple user experiences, such as table height, lighting, and seating comfort, to support Ubud's image as a premium culinary destination.
		Threats	
People	Positive sentiment was quite high (88%) in restaurant reviews, with phrases like "friendly people" and "lovely people," but also complaints such as "people complain," "packed people," and "noisy people."	The overcrowding of tourists in Ubud's popular dining areas creates a crowded, noisy atmosphere and diminishes the enjoyment of dining. This reflects overtourism, which can compromise the quality of culinary experiences and risk tarnishing Ubud's image as a tranquil and cultured gastronomic destination.	Destination managers must implement visitor management and culinary zoning strategies, such as deploying new gastronomic centers outside central Ubud, adjusting restaurant operating hours, and promoting alternative culinary areas. Education tourists about local culinary etiquette and regulations can help maintain a positive atmosphere and respect Balinese dining culture.
Price	Positive sentiment is quite high (90%) including "great-price", "price-fair", "happy-hour-price", "good-price-reasonable", but also complaints like "bad-price", "price-charged", "mediocre-price-limited", "dissapointed-price".	Most tourists feel culinary prices in Ubud commensurate with the quality, but concerns are rising about eateries that are overpriced or not worth the value. This could threaten Ubud's competitiveness as a gastronomic destination if not managed properly, especially amid rising raw material prices and competition from other tourist areas on Bali.	Culinary managers and businesses must maintain price transparency and balance quality and value for money. Strategies include creating segment-based restaurant price guides (casual and fine dining), promoting affordable local culinary packages, and educating tourists about the unique value experience of Ubud, which focuses not only on price but also on quality, local ingredients, and the cultural atmosphere.
		Opportunities	
Cuisine	Positive sentiment restaurants (89%) and X (98%) includes phrases such as "indian-cuisine," "great-cuisine," "fine-cuisine," "local-special-cuisine," "western-style-cuisine," "cuisine-perfectly-prepared," "indonesian-cuisine," "cuisine-ubud," "promotes-indonesian-cuisine," and "true-cuisine-place."	Tourists appreciate Ubud's wide culinary diversity, from authentic local dishes to elegantly presented modern cuisines. This presents a significant opportunity to strengthen Ubud's image as a global gastronomic destination that highlights diverse flavors and culinary innovations.	The "Ubud World Cuisine Experience" program, combining traditional and international cuisine with Balinese cultural values, can be developed at the Ubud Food Festival. Stakeholders can support collaboration between local and international chefs, cross-cultural events, and global promotion of Ubud's signature cuisine to strengthen its appeal and uniqueness
Street	Strong positive sentiment on X (91%) reflects the context of street food, marked by expressions such as "like," "delicious," "top," "amazing," and "local," indicating a high interest in locally oriented street-food experiences.	Street food is an attractive element for tourists seeking authentic and affordable culinary experiences. Ubud has significant potential to promote street food culture as part of Bali's gastronomic identity, which is rooted in local traditions and ingredients.	Destination managers can develop an "Ubud Street Food Program" that presents Balinese specialties with consistent quality and hygiene. Annual street-food festivals, vendor certifications, and promoting an "true street-style local taste" narrative can further widen Ubud's appeal to younger travelers and food explorers.

Based on the SWOT analysis results for gastronomy aspects in Table 6, the following is a synthesis of the SWOT analysis. Ubud has dominant strengths in terms of culinary authenticity, service quality, atmosphere, and the value of the overall gastronomic experience. The results of the sentiment analysis show positive consistency in various aspects such as food, value, location, rice, place, service, staff, view, ingredients, café, festivals, and atmosphere, which illustrates that tourists not only appreciate the taste of food but also enjoy a dining

experience integrated with natural beauty, local culture, and typical Balinese hospitality. This excellence confirms Ubud's position as a gastronomy destination that offers high-quality cuisine and presents a strong sense of place, where food, people, and the environment combine to create an authentic and memorable culinary experience. Strategic implications that can be considered include focusing on branding Ubud as an "Authentic Sustainable Gastronomy Destination" highlighting the combination of taste, nature, and culture; maintaining Balinese hospitality through continuous training for staff and chefs; integrating the concept of eco-gastronomy (local ingredients, environmentally friendly, and supporting local farmers); and utilizing events such as the Ubud Food Festival as a platform to strengthen the global image and showcase sustainable culinary identity. In terms of weaknesses, the main weaknesses were identified in the taste, chef, and table aspects, indicating inconsistencies in quality and authentic experiences at restaurants. This undermines tourists' perceptions of Ubud's gastronomic standards. Strategic implications that can be considered include standardizing taste and presentation quality across restaurants to maintain consistency, encouraging local chef certification and professional training that emphasizes creativity and communication with tourists, improving standards of cleanliness, ergonomics, and dining room design to align with premium tourist expectations, and establishing a Ubud culinary association to serve as a coordinating body for quality and service standards among businesses. In terms of opportunities, festivals, cuisine, and street food offer opportunities for developing gastronomic innovation, diversifying markets, and expanding audience reach. Tourists are attracted to new experiences such as fusion cuisine and authentic street food. Strategic implications to consider include developing the Ubud World Cuisine Experience, featuring collaborations between local and international chefs, which could be integrated into the Ubud Food Festival; launching the Ubud Street Food Program, which highlights Balinese street food with high hygiene standards and local storytelling; leveraging the culinary festival's momentum to promote internationally and empower local culinary MSMEs; and promoting digital promotions with narratives such as "from paddy to plate" and "authentic culinary adventure" to attract the global foodie traveler segment.

Finally, in terms of threats, threats arise from people (overtourism, crowding) and prices (perceptions of high prices in some locations). Both have the potential to undermine Ubud's peaceful dining experience and competitive value. Strategic implications to consider include implementing visitor management and culinary zoning to avoid overcrowding in popular areas (for example, by spreading culinary destinations to surrounding villages), promoting reasonably priced local cuisine and price transparency to maintain tourist trust, employing a communication strategy that emphasizes "value for experience," not just price, and developing a smart culinary mapping system to balance tourist flow and maintain Ubud's distinctively serene atmosphere.

Overall, the integrated SWOT analysis and sentiment findings confirm that Ubud is strategically positioned as a mature, yet dynamic gastronomic destination ready for development. The combination of stable strengths, evolving opportunities, and manageable weaknesses and threats through targeted interventions demonstrates that Ubud's gastronomic ecosystem is not only competitive but also highly adaptable to the needs of global travelers. These findings provide a more clearer picture of how tourist perceptions, service performance, and culinary experience elements interact to shape Ubud’s current gastronomic image. With this foundation, future development strategies can be designed with greater precision, enabling Ubud to maintain its position as a benchmark for sustainable gastronomic destinations.

This study had several limitations that should be considered when interpreting the results. First, sentiment analysis relies on digital review data from specific platforms, thus biasing the representation toward travelers who actively provide online reviews. Groups of travelers who do not write reviews or provide only brief reviews may not be optimally represented. Second, the linguistic context in reviews, such as irony, sarcasm, or local phrases, can potentially introduce interpretation biases, even after data cleaning and classification. Third, the study did not differentiate tourist characteristics based on country of origin, culinary preferences, or spending categories; therefore, the analysis was unable to provide more precise segmentation. Future studies can be conducted in several directions. First, future research could expand the data sources by incorporating more real-time digital platforms and social media to capture more comprehensive perception dynamics. Second, an analysis based on tourist segmentation, such as culture of origin, travel motivation, or spending power, would provide a more precise picture of culinary preferences in Ubud. Third, a time-based approach (weekly, monthly, or yearly) can be used to monitor changes in sentiment over time, particularly during peak tourist seasons or culinary festival periods.

5. Conclusion

The results of this study indicate that the model evaluation yielded good results, with the fine-tuning model achieving evaluation metrics exceeding 90% for both TripAdvisor and X. Furthermore, the insights analysis revealed that the gastronomic experience in Ubud was positively perceived by tourists, both through in-depth reviews on TripAdvisor and spontaneous opinions on X. Both platforms placed food as the most dominant aspect, but their communication patterns differed. TripAdvisor focused more on detailed evaluations (taste, presentation, service, atmosphere), whereas X emphasized cultural narratives, promotions, and participatory experiences, particularly related to events such as the Ubud Food Festival. These different platform characteristics enriched our understanding of how tourists interpret Ubud's culinary scene from both personal and collective perspectives. The SWOT analysis revealed that Ubud has significant strengths in authenticity of taste, service, atmosphere, use of local ingredients, and perceived value for money. These factors confirm Ubud's position as one of Indonesia's leading gastronomic destinations. However, weaknesses need to be addressed, particularly related to taste inconsistencies, variations in chef quality, and physical comfort issues such as cleanliness or table ergonomics. However, there are significant opportunities through culinary festivals, street food, and menu diversification, which can encourage innovation and support global promotion. Threats such as overtourism and rising price perceptions must be managed to maintain the quality of culinary experiences. Overall, these findings confirm that Ubud's main strength lies in the combination of taste, nature, and culture, which creates unique and high-value dining experiences. By strengthening quality standards, maintaining the sustainability of local ingredients, and optimizing cultural events and storytelling, Ubud has the potential to become even more established as an Authentic Sustainable Gastronomy Destination at the regional and global levels.

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