

How can Digital Tourism Big Data Analysis Unlock Untapped Tourism Potential?

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Abstract: This research delves into the realm of digital tourism, aiming to unlock untapped potential through the analysis of big data. Utilizing Brand24, the study collects extensive data on traveler trends, preferences, and location ratings sourced from various digital channels, including tourism websites, social media platforms, and travel forums. Employing advanced keyword search and monitoring capabilities, the data undergoes rigorous qualitative and quantitative analysis to discern emerging patterns and sentiments. The primary objective lies in the identification of potential tourism development opportunities within the Buton Islands. By scrutinizing growth potential, desirability, and socio-economic impact, strategic decisions are formulated to cultivate a focused tourism strategy. This strategy not only aims at fostering economic growth but also prioritizes environmental sustainability. The significance of this study lies in its emphasis on the pivotal role of big data in deciphering and anticipating trends in the dynamic tourism sector. Through comprehensive analysis, the research seeks to provide actionable insights for stakeholders to capitalize on burgeoning tourism opportunities effectively. By bridging the gap between traditional tourism practices and contemporary data-driven insights, this research offers a pioneering approach to destination management. It advocates for the integration of digital tourism big data analysis as a cornerstone of strategic decision-making processes within the tourism industry. In conclusion, this study underscores the transformative potential of digital tourism big data analysis in unlocking hitherto unexplored avenues for tourism development. It serves as a beacon for future research endeavors and practical implementations aimed at harnessing the power of big data to propel sustainable tourism growth.

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INTRODUCTION

The utilization of big data analytics in the tourist industry is a potent instrument that facilitates the identification and exploitation of untapped prospects (Łukasiewicz, 2020; Shaikh, 2022). Nevertheless, it encounters several obstacles such as insufficient comprehension of tourist behavior, limitations in data-driven decision-making, and restrictions in tourism marketing and promotion (Dwivedi et al., 2022). Despite the abundance of big data, numerous tourism destinations continue to depend on intuition and experience, resulting in ineffective decision-making and limited prospects (Díaz-González et al., 2022; Pugna et al., 2019). Big data analytics can effectively tackle these challenges by offering in-depth analysis of tourist preferences, behaviors, and activities (Agrawal et al., 2022).

Furthermore, the utilization of big data analytics can assist in surmounting limitations in tourism marketing and promotion, which may prove to be unproductive and monetarily expensive in the absence of a profound comprehension of tourist preferences and behavior (Xu & Han, 2022). Big data analytics can improve marketing and promotion strategies in the tourism sector by offering valuable insights into these elements, leading to increased efficiency and overall success.

The tourism sector is leveraging big data analytics to enhance passenger experience and understand visitor behavior (Fuchs et al., 2014; Vu et al., 2018). This data, derived from digital platforms like tourism websites, social media, and travel applications, provides valuable insights into visitor preferences, travel trends, and visitation patterns. By monitoring engagement with these platforms, we can identify patterns in tourist behavior, such as lodging preferences, attractions, activities, and expenditures. This information is crucial for creating tourism products and services that cater to travelers' needs and preferences (Tussyadiah & Pesonen, 2016; Versichele et al., 2014).

The study of large datasets also allows for the detection of emerging travel trends, such as popular destinations, in-demand tourist activities, or peak visitation periods (Shi et al., 2017; Sottini et al., 2021). This data can be used to develop more efficient marketing and promotion tactics and control destination capacity. By understanding travelers' preferences, travel trends, and visitation patterns, policymakers can develop tourism regulations, infrastructure, and initiatives that cater to market demands. Big data analytics also helps assess the effectiveness and influence of policies and initiatives, enabling the implementation of necessary modifications and enhancements (Popović et al., 2018).

Digital tourism big data analytics is a powerful tool for enhancing efficiency and effectiveness in tourism development and marketing (Ardito et al., 2019; Xiang & Fesenmaier, 2017). By acquiring profound insights into tourist behavior and travel patterns, stakeholders can make well-informed decisions when devising sustainable and captivating tourism plans. Tourism is a vital sector that plays a significant role in promoting sustainable policy. The use of big data analytics in the tourism industry allows for more informed and environmentally friendly choices. By analyzing visitor behavior, travel trends, and visitation patterns, we can gain a deeper understanding of the ecological consequences of the tourism industry (Ardito et al., 2019; Miah et al., 2017). This data can help policymakers develop efficient destination management plans, ensuring a balance between tourism and environmental preservation. By understanding tourist patterns, local authorities can manage access to environmentally fragile places, reducing adverse effects like ecological harm and overcrowding.

The Buton Islands, particularly in Baubau City and South Buton Regency, are leveraging big data analysis to assess the effectiveness of sustainable measures. This data can be used to create environmentally friendly advertising strategies, enhancing the destination's reputation as a sustainable destination and encouraging environmentally friendly travel habits. The digital transformation of tourism, particularly in the Buton Islands, is crucial for economic expansion, investment, employment, and local revenue (Kodir et al., 2020). The study aims to explore the potential of digital tourism big data

analysis in uncovering unexplored tourism opportunities in the Buton Islands, thereby enhancing the appeal and operational effectiveness of tourism destinations.

The Buton Islands possess abundant natural beauty and cultural legacy, which make them highly suitable for tourism development (Putra et al., 2021; Salma et al., 2022). However, their full potential remains untapped due to various limitations, including inadequate tourism infrastructure, ineffective promotion, and insufficient awareness of tourist preferences. Analyzing big data in digital tourism can offer profound insights into the behavior of tourists, their tastes, travel trends, and patterns of visitation. This empowers stakeholders to make well-informed decisions in the growth of tourism. The objective of this research is to address obstacles that impede the progress of tourism in the Buton Islands. It seeks to offer fresh perspectives and creative ideas to enhance the tourism industry, create new prospects for local economic advancement, and enhance the well-being of the residents.

This research aims to explore the potential of big data analytics in the tourism industry, focusing on the Buton Islands. It will explore various big data analytics methodologies, such as data mining, machine learning, and sentiment analysis, to understand passengers' opinions of destinations and facilitate efficient promotional decisions. The study will provide practical recommendations for tourism stakeholders in the Buton Islands to implement activities that would improve tourism growth. The research is expected to contribute significantly to understanding how digital tourism big data can reveal unexplored opportunities in the Buton Islands area, benefiting both public and commercial sectors in their efforts to foster tourism.

RESEARCH METHOD

The study uses Brand24 to gather data on tourist trends (Wiliam et al., 2020), preferences, and location assessment. It uses various digital channels like tourism websites, social media, and travel platforms like TripAdvisor, Booking.com, and Airbnb. The data will be analyzed using keyword search and monitoring capabilities. Analytical skills will be employed to understand emerging patterns and sentiment. This comprehensive understanding of visitor behavior, preferences, and trends can help create more effective and environmentally sustainable tourism projects. The use of both qualitative and quantitative methodologies will be employed to analyze the data.

The data analysis phase will use the Brand24 application (Catalani et al., 2021), to analyze data from digital tourism platforms, including websites, social media, and travel applications. The collected data will include reviews, comments, and posts related to the researched tourism destinations. Big data analysis techniques, such as data mining, machine learning, and sentiment analysis, will be employed to uncover insights. Data mining will identify patterns in tourist behavior, while machine learning will predict travel trends and understand travelers' preferences. Sentiment analysis will help understand tourists' perceptions and opinions about the destinations. This comprehensive analysis will aid in more accurate decisions in tourism development.

The identification stage of the research involves analyzing data from various digital sources, including tourism websites, social media platforms, and user reviews, to identify

potential opportunities for tourism development in the Buton Islands. This data study aims to identify novel tourism offerings, enhanced infrastructure, and efficient advertising tactics to attract more tourists (Vecchio et al., 2018). The results will identify three most promising opportunities for tourism development, based on their potential to enhance the Buton Islands' appeal and competitive edge. Strategic decisions will be made based on growth potential, desirability, and socio-economic impact, ensuring a focused tourism strategy that benefits both economic growth and environmental conservation.

Finally, the decision-making stage begins with identifying needs and collecting data from various sources, such as websites, surveys, and internal organizations. The data is then analyzed using advanced techniques to understand tourist behavior and assess the impact of strategic decisions. The final step is formulating and implementing strategic decisions, which involve coordination, communication, and monitoring of stakeholders to achieve targeted goals. This systematic approach ensures accurate and efficient decision making in the tourism sector.

RESULTS AND DISCUSSION

A study of Buton Tourism conducted using the Brand24 platform showed significant trends in mention volume, social media reach, and non-social media reach from March 24 to April 23, 2023. The graph shows the level of conversation or discussion activity related to tourism destinations in Buton, while the social media reach graph reflects the spread of information on platforms such as Facebook, Twitter and Instagram. The non-social media reach graph provides an overview of coverage in traditional media. The mentions per category classify the most frequently discussed topics, such as tourist attractions, accommodation, culinary and leisure activities.

Understanding these preferences can help authorities' direct tourism promotion and development efforts more effectively. Key metrics such as total number of mentions, average mentions per day, and average reach per mention can be used to evaluate the effectiveness of existing promotional campaigns and design new strategies to introduce Buton's tourism potential to a wider audience. This data can be the basis for directing policy and investment in the tourism sector, aiming to increase the attractiveness and overall economic prosperity of the Buton Islands.

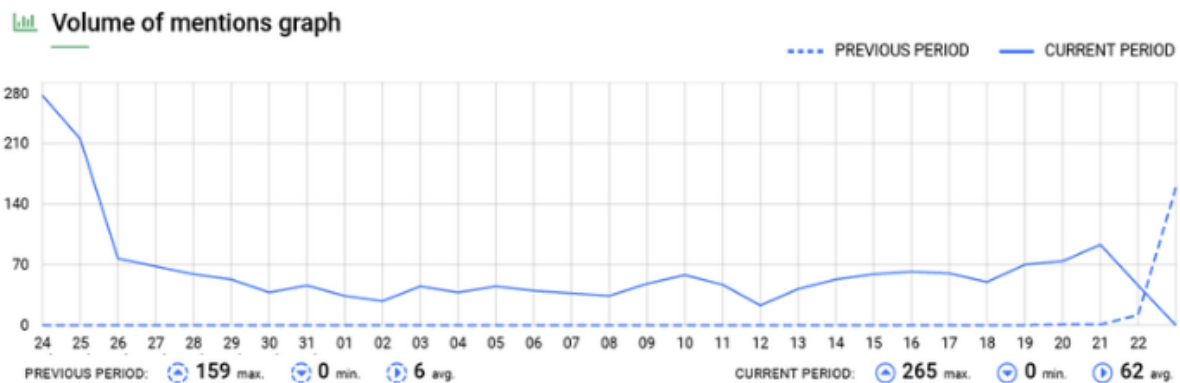


Figure 1. Trend Volume of Mention Graph

Brand24's data analysis of the volume of mentions trend graph (in Figure 1) shows a significant shift in the volume of mentions from the previous period to the current

period. The previous period showed an upward trend with a maximum of 159 mentions, while the minimum downward trend reached 0, indicating a stable decline. The minimal decline in the downward trend indicates that interest or talk about "Buton Tourism" has remained stable, perhaps due to increased promotion, related events, or greater media exposure.

A significant upward trend in the current period indicates an increase in interest or talk, perhaps due to wider media coverage, increased public awareness, or more aggressive promotion. This change can be used as an indicator for those involved in the promotion or management of the "Buton Tourism" destination to understand trends in public interest and identify effective strategies to expand coverage and attract more visitors. By paying attention to these trends, stakeholders can adjust their marketing or promotion strategies to optimize their impact and strengthen the position of "Buton Tourism" as an attractive tourist destination.

Communication and marketing theory plays an important role in understanding the dynamics of people's behavior in the context of social media (Javornik, 2016) Analysis of trends in the volume of mentions of "Buton Tourism" reveals that external factors such as promotion, media coverage, and public awareness shape trends in interest in specific tourism destinations. This is in line with communication and marketing theory which recognizes the role of media in shaping consumer perceptions and behavior. Understanding trends and changes in social media user behavior is essential to reflect public interest and attention to a tourism destination, thus strengthening the relevance of theories about its influence on image formation and travel decisions.

Meanwhile, the findings of this study contribute in terms of practical emphasizing the importance of promotional strategies is very important for local governments and tourism agents to attract more visitors to their destinations. By adapting to changing trends in the mentioned volume, practitioners can optimize promotional campaigns and attract more visitors. This includes using content strategies, partnerships with local influencers, and increasing exposure through digital platforms. By continuously monitoring and analyzing social media data, practitioners can identify emerging opportunities and challenges, ensuring the success of their promotional campaigns in the competitive tourism industry.

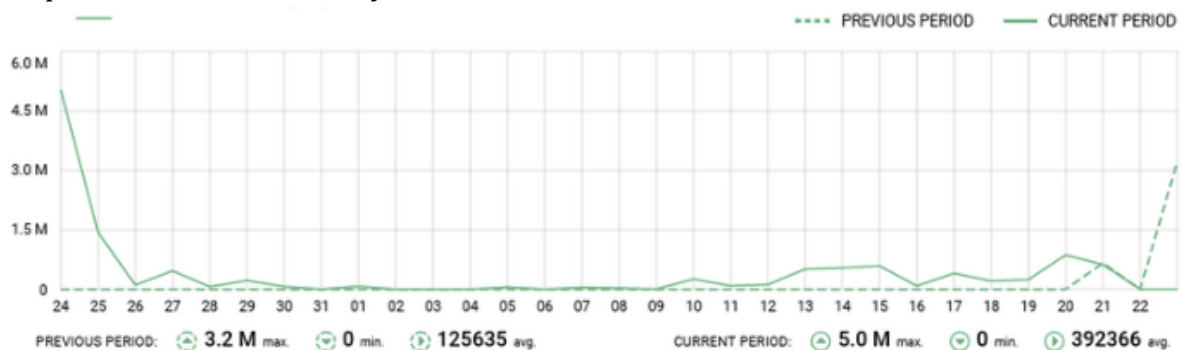


Figure 2. Trend of Social Media Reach Graph

Figure 2 explains that Buton tourism has experienced a significant surge in interest and discourse, with an average social media reach of 392,366. This indicates the potential for increased public interest in tourist destinations in Buton. Local governments and

stakeholders in the tourism industry may consider intensifying promotional efforts and undertaking development initiatives to attract more visitors, expand their impact on the local economy, and introduce more people to Buton's natural splendor. Media analysis of Buton tourism highlights the importance of promoting tourism and enhancing the local experience.

Buton tourism has seen a substantial increase in public sentiment, with a surge in engagement on social media. This shift in public sentiment indicates a growing interest in the region, particularly in Southeast Asia. Social media reach has reached 5 million, surpassing previous figures, indicating a significant impact on the industry. Local governments and industry players can capitalize on this momentum by redoubling promotional efforts and investing resources into tourism infrastructure development. This shift in public sentiment is critical to the growth of Buton's tourism industry.

Brand24's data base thus reveals the potential of the Buton Islands as a fast-growing tourist destination. The region's cultural heritage and natural wonders have captured the world's attention, attracting many visitors. Local governments and the tourism industry can drive economic growth by increasing visitor numbers and investment. By showcasing Buton's unique attractions, they can foster appreciation and conservation efforts for its pristine landscapes and rich tapestries. This analysis calls for concerted action to harness Buton's tourism potential for the benefit of residents and visitors alike.

The increasing social media engagement in Buton's tourism industry underscores the importance of destination marketing theory. Effective brand promotion and management can significantly increase public interest and participation in a destination (Huerta-Álvarez et al., 2020). Concepts such as brand management of tourist destinations, marketing communications, and the use of social media are essential. The theoretical implications suggest an integrated and sustainable approach to destination marketing, including creative promotional strategies, strong brand building, and information technology to reach a wider audience.

The increasing social media engagement in Buton tourism has significant implications for local governments, industry players, and communities. To capitalize on this, they must invest in promotional efforts, infrastructure development, and sustainability. This includes active use of social media, collaboration with digital influencers, and innovative marketing campaigns. In addition, they must also prioritize the preservation of the environment and cultural heritage and ensure equitable economic benefits for local communities. By implementing these measures, local governments in the Buton islands can optimize their tourism potential for sustainable economic growth and community welfare.

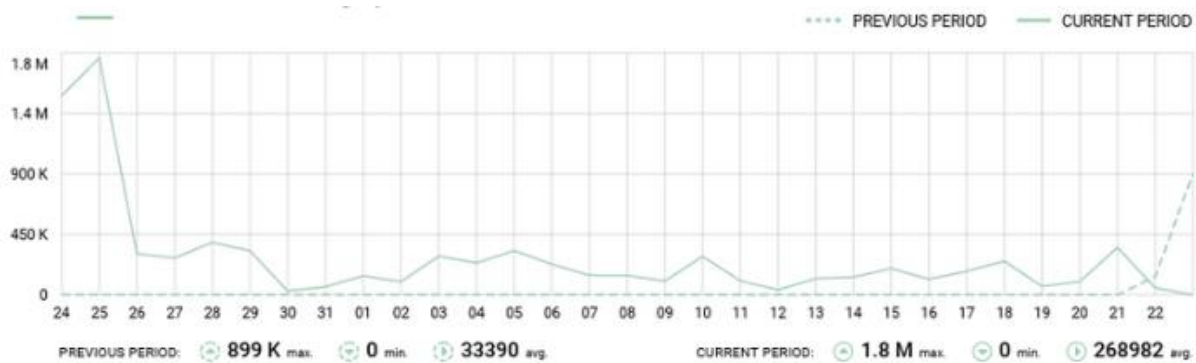


Figure 3. Trend of Non-Social Media Reach Graph

Searches for "Buton Tourism" on Brand24 based on the non-social media reach graph (see Figure 3) show significant growth in recent times. The previous period showed an upward trend of 899 thousand, with an average of 33,390. However, the last period saw a tremendous jump of 1.8 million, with an average gain of 268,982. This indicates a significant growth in interest and discussion around the destination, which may be due to effective promotions, extensive media coverage, or specific events. The surge in conversation volume reflects people's growing interest in the destination.

Understanding tourism trends is very important for stakeholders in Buton Tourism to optimize promotion and development efforts. By monitoring online conversations and search trends, stakeholders can capitalize on emerging opportunities in the sector. Data-driven insights are essential to gauge people's interest and improve promotional strategies. Continuous monitoring ensures agility in response to evolving market conditions, ensuring sustainable growth and relevance in the competitive tourism industry.

The surge in interest in Buton Tourism underscores the importance of trend analysis in understanding consumer behavior in the tourism industry. Theories such as tourism attractiveness and consumer behavior can help identify factors that drive public interest in a destination (Han, 2021). The surge in conversations also provides insight into how technology and social media affect perceptions and exposures of tourism destinations. By improving theoretical understanding, researchers can develop more accurate models to forecast future trends in the tourism industry.

The increasing interest in Buton Tourism has significant implications for local governments, tourism businesses, and businesses. It emphasizes the need for tourism infrastructure development, including accommodation and transportation, to accommodate more tourists. Promotion and marketing of destinations is very important to attract more tourists. Data analysis can help design effective promotional strategies, target relevant markets and use social media and digital technologies to increase exposure. Adopting a data-driven approach can maximize growth potential and strengthen Buton Tourism's position as an attractive tourist destination.

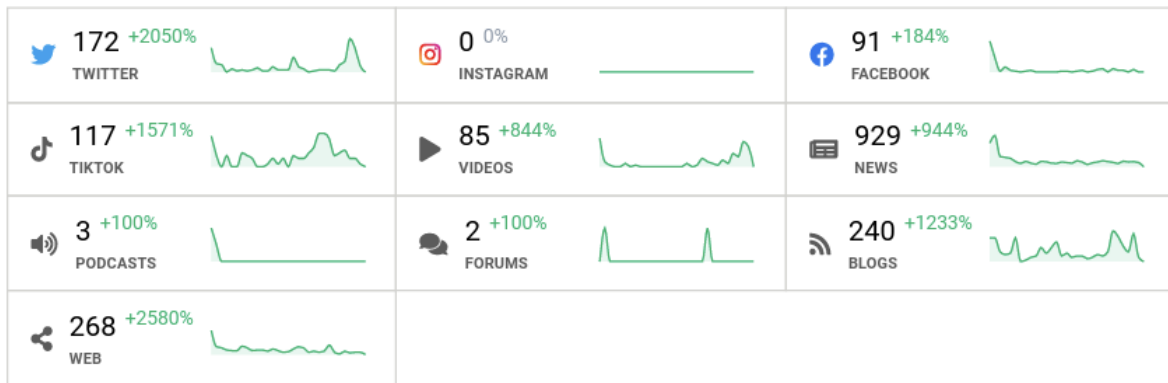


Figure 4. Trend of Mention per category.

Furthermore, Figure 4 with mentions per category shows a significant increase in mentions across various social media platforms and online media. Twitter experienced a significant spike with 172 mentions, indicating its superiority in discussions about Buton's tourist destinations. Instagram remained stagnant, while Facebook saw a significant increase with 91 mentions. TikTok, a popular short video platform, also saw a significant increase with 117 mentions, indicating increased attention to Buton Tourism. The video category, including platforms like YouTube, saw an 844% increase, while the news category saw a 944% increase. Podcasts, forums, and blogs also contributed positively, with podcasts recording 3 mentions and forums and blogs recording 2 and 240 mentions. The analysis also shows a remarkable increase in mentions on the web, reaching 268 mentions and an increase of 2580%, indicating that interest and exposure to Buton Tourism is expanding across various websites and online platforms, providing greater promotional potential for the destination.

The increasing mention of Buton's tourist destinations on social media and online platforms highlights the need for tourism communication and promotion theories to adapt to new consumer interactions. Understanding how social media and online platforms influence consumer perceptions and behaviors towards tourism destinations is crucial. Theories related to tourism promotion must be constantly updated to understand the influence of new platforms such as TikTok and podcasts on travelers' interest in specific destinations.

Tourism marketing should focus on social media and online platforms to reach potential audiences. The surge in mentions on Twitter indicates an increase in presence and engagement. Variety in media content, including video, news, podcast, forum, and blog categories, is critical to reaching a diverse audience. Understanding content trends across multiple platforms can help design effective campaigns, increase awareness and interest in Buton's tourism destinations.













 1907 MENTIONS	 465 SOCIAL MEDIA MENTIONS	 1442 NON-SOCIAL MENTIONS	 12 M SOCIAL MEDIA REACH
 8.3 M NON SOCIAL MEDIA REACH	 97 126 INTERACTIONS	 710 USER GENERATED CONTENT	 86 303 LIKES
 35 81% POSITIVE MENTIONS	 8 19% NEGATIVE MENTIONS	 \$ 1.3 M AVE	 172 MENTIONS FROM TWITTER

Figure 5. Trend of Numerical summary

From March 24, 2023, to April 23, 2023, there has been a significant increase in mentions of Buton tourism, mainly due to the use of big data. The Brand24 app showed a 1002% jump in mentions related to the subject of digital travel, reaching a total of 1907. This highlights a shift in understanding the intricacies of contemporary tourism and the importance of big data research in identifying consumer trends, patterns and preferences. By analyzing big data, industry players can create more efficient marketing tactics, improve the tourist experience, and create tourism products and services that match market demand.

The significant surge in digital tourism references signals a fundamental shift in people's engagement with tourism information, with the tourism sector heavily influenced by the availability of large amounts of data and the ability to analyze it effectively. Big data plays an important role in guiding decisions and plans, marking an important milestone in making full use of the capabilities of the digital age for the advancement of the tourism sector.

The increasing use of big data in tourism analytics underscores the need for an interdisciplinary approach. Theories from computer science, statistics, and data analysis are increasingly relevant in understanding market dynamics (Akter & Wamba, 2019) Machine learning, data mining, and sentiment analysis are critical in parsing the complex patterns of big data generated by digital activities, highlighting the need for cross-disciplinary research to understand consumer behavior and tourism industry dynamics.

The use of big data in the tourism industry can significantly improve marketing strategies, customer experience, and product development. By accurately identifying travelers' preferences and needs, businesses can develop targeted marketing strategies, tailor services to market demands, and create personalized travel experiences. This not only increases the competitiveness of the industry, but also helps business actors to respond quickly to changing trends and market needs.

CONCLUSION

Digital tourism big data analysis offers a transformative opportunity to unlock untapped tourism potential, as evidenced by the surge in mentions of Buton tourism from March 24, 2023, to April 23, 2023. This research highlights the importance of interdisciplinary research in tourism, which integrates computer science, statistics, and data analysis with traditional tourism studies to provide a comprehensive understanding of market dynamics and consumer behavior. Researchers must also dig deeper into

external factors such as promotion, media coverage, and public awareness to understand the drivers behind travelers' behavior and preferences.

Based on big data analysis, the study found the dynamic nature of social media can inform effective marketing strategies and improve destination promotion efforts. Practitioners in the tourism industry should use a data-driven approach in decision making, leveraging big data analysis to gain actionable insights into consumer preferences, market trends, and emerging opportunities.

In addition, customized marketing strategies can be developed by identifying content trends and consumer behavior patterns, to maximize the impact of promotional efforts. Infrastructure development, including accommodation, transportation, and tourist attractions, should be prioritized to improve the overall visitor experience and capitalize on tourism growth.

This research concludes that digital tourism big data analysis has enormous potential to open up untapped tourism opportunities. By embracing an interdisciplinary research approach and leveraging data-driven insights, stakeholders can drive sustainable tourism development, enhance destination competitiveness, and realize the full potential of Buton tourism.

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