IRHAMNA
Indonesian Research of Sustainability Management, Business, & Administration
Volume 1, Number 2, 2025 pp. xx-xx
E-ISSN : XXXX-XXX

Building Smart Tourism Through Business Intelligence: Social Media Analytics in the Indonesian Travel Market

Moch Dhisa Rizky Madani[1]*, Ramdan Saeful Qoyim[2]

[1] Departement of International Relations, Universitas Al-Ghifari, Bandung, Indonesia [2] Universitas Kebangsaan Republik Indonesia, Bandung, Indonesia

[1] mochdhisarm01@gmail.com
[2] qoyimramdanseful@gmail.com

Article History

Received :
Revised :
Accepted :

ABSTRACK

The tourism industry in Indonesia is increasingly influenced by digital transformation, particularly through the integration of Business Intelligence (BI) systems. Despite the growing volume of social media interactions in the travel sector, many Indonesian tourism enterprises struggle to convert these data into actionable insights. This study aims to explore how social media analytics, as a subset of BI, contributes to the development of smart tourism in Indonesia. Employing a qualitative exploratory design, the research collected primary data through semi-structured interviews with twelve key stakeholders, including travel agency managers, marketing specialists, and data analysts. Secondary data were also drawn from BI dashboards and social media analytics tools such as Facebook Insights and Twitter Analytics. Thematic analysis revealed five key findings: (1) social media platforms provide real-time insights into tourist behavior; (2) BI systems support strategic planning and operational alignment; (3) personalization and customer engagement are enhanced through data-driven segmentation; (4) challenges persist in technical capacity, infrastructure, and data ethics; and (5) localization of BI tools is crucial for accurate and culturally sensitive analysis. The study contributes both theoretically and practically by contextualizing BI adoption within the Indonesian tourism industry, highlighting its strategic value and identifying barriers to implementation. These findings support the advancement of smart tourism initiatives and offer practical guidance for travel operators, policymakers, and platform developers. Future research is encouraged to adopt mixed-methods approaches and evaluate BI impacts on organizational performance across diverse tourism settings.

Keywords: *Business Intelligence; Social Media Analytics; Smart Tourism; Travel Industry; Indonesia*

Available Online:

This is an open access article licensed under a Creative Commons Attribution-ShareAlike 4.0 International License

1. INTRODUCTION

The tourism industry has witnessed a significant transformation with the rise of digital technologies, particularly through the integration of Business Intelligence (BI) systems. In today's data-driven environment, tourism stakeholders—from government agencies to private travel agencies—are increasingly leveraging BI tools to improve strategic decision-making, enhance customer experiences, and respond to dynamic market trends (Baggio, 2016; Mariani et al., 2018). Business Intelligence, defined as the systematic collection, analysis, and visualization of business-related data, has emerged as a cornerstone of smart tourism initiatives (Stylos & Zwiegelaar, 2019).

Indonesia, one of Southeast Asia's largest tourism markets, offers a compelling case for the application of BI in tourism. The country has seen rapid growth in digital adoption, with over 212 million internet users and a vibrant social media ecosystem as of 2024 (Yulianto et al., 2018). Travel-related businesses in Indonesia, especially micro and medium enterprises, are increasingly turning to social media platforms like Facebook, Instagram, and Twitter to engage consumers and market destinations.

* *Corresponding Author:* mochdhisarm01@gmail.com

These platforms not only serve as marketing channels but also as rich data sources that can be mined for behavioral insights using BI tools (Bustamante et al., 2020).

Social media analytics—the process of extracting actionable insights from user-generated content—has proven especially valuable in the travel and tourism sector. From understanding customer sentiment to identifying trending destinations, BI systems powered by social media data are helping tourism operators personalize offerings and respond swiftly to market changes (Grasso, 2017; Bustamante et al., 2020). In the Indonesian context, the real-time nature of social media data offers a unique opportunity to monitor tourist preferences, identify service gaps, and evaluate the performance of promotional campaigns (Yulianto et al., 2018).

Previous studies have demonstrated the effectiveness of BI in enabling destination competitiveness and operational efficiency (Fly et al., 2008; Yuliani et al., 2017). The deployment of BI dashboards, big data platforms, and recommender systems has facilitated better alignment between traveler demand and service supply (Bustamante et al., 2020). Moreover, intelligent systems built on BI architectures have been shown to enhance dynamic pricing models, resource allocation, and customer relationship management strategies (Baggio, 2016).

Despite these advancements, the Indonesian tourism industry still faces considerable challenges in BI adoption. These include technological barriers, limited analytical capabilities among travel SMEs, and low investment in integrated data systems (Yulianto et al., 2018; Yuliani et al., 2017). In many cases, travel agencies rely on manual interpretation of social media metrics, missing the opportunity for deeper, real-time insights (Serbanescu & Necsulescu, 2013). This gap underscores the urgent need for scalable and user-friendly BI frameworks tailored to the local market context.

The growing emphasis on smart tourism—where technology enhances all aspects of the tourism experience—necessitates a better understanding of how BI and social media analytics can contribute to sustainable destination development (Baggio, 2016; Mariani et al., 2018). Particularly in a post-pandemic recovery phase, data-driven decisions will be vital in restoring tourist trust, allocating limited resources, and maximizing promotional effectiveness (Razafindrazanakolona et al., 2023; Dentini, 2025).

Given this backdrop, the objective of this study is to explore the role of Business Intelligence in shaping smart tourism strategies through social media analytics in the Indonesian travel market. Specifically, the study seeks to identify what types of social media data are most valuable for travel businesses, how these data are analyzed and interpreted, and what strategic outcomes are enabled by such insights. Through this lens, the research aims to contribute to the growing body of knowledge on digital transformation in tourism while offering practical guidance for Indonesian stakeholders on leveraging BI systems effectively.

2. METHODOLOGY

This study adopts a qualitative exploratory research design aimed at uncovering how Business Intelligence (BI), particularly through social media analytics, supports smart tourism initiatives in Indonesia. A qualitative approach is appropriate for investigating complex, context-dependent phenomena such as the integration of social media data in travel business decision-making (Miles & Huberman, 1994; Braun & Clarke, 2006). Given the emergent nature of BI practices in Indonesia's tourism sector, this methodology allows for flexibility in uncovering patterns, stakeholder perspectives, and localized technological adoption strategies.

2.1 Data Collection

Primary data were collected through semi-structured in-depth interviews with key stakeholders in the Indonesian travel industry. Participants included digital marketing managers from travel agencies, tourism board officials, and data analysts from companies implementing BI platforms in tourism. A total of 12 participants were purposively selected to ensure diverse insights across institutional and technological contexts (Tranfield et al., 2003). Interviews lasted between 45–60 minutes and were conducted either face-to-face or via online conferencing tools.

In addition to primary interviews, this study also incorporated secondary data from digital reports, BI dashboards, and publicly available social media analytics on platforms such as Facebook Insights, Twitter Analytics, and Instagram Business Tools (Bustamante et al., 2020; Yulianto et al., 2018). These data sources provided triangulation to ensure consistency and enrich the contextual analysis.

2.2 Data Analysis

Thematic analysis was employed to interpret the qualitative data. This method is well-suited to identifying recurring themes across narratives and organizational practices (Braun & Clarke, 2006). Data

coding was conducted using NVivo software, which facilitated systematic categorization of themes such as “real-time insight”, “consumer engagement”,“BIdashboard utilization”, and “barriers to adoption”.

The analysis followed Braun and Clarke’s (2006) six-phase process: familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. All transcripts were coded independently by two researchers to improve reliability and minimize bias.

2.3 Validity and Trustworthiness

To ensure the validity of findings, this study employed methodological triangulation, using both interview and document data (Miles & Huberman, 1994). Member checks were conducted by returning synthesized findings to a subset of participants for feedback. Additionally, audit trails and reflective memos were maintained throughout the research process.

2.4 Ethical Considerations

Ethical approval was obtained from the affiliated academic institution. All participants were informed of the study’s purpose and provided written consent. Anonymity and confidentiality were strictly maintained throughout the research process.

2.5 Justification of Method

This methodology is considered suitable given the study’s exploratory aim to understand how social media data are used in BI systems within the Indonesian tourism market. Prior BI research in tourism contexts has often relied on case-based, qualitative approaches to capture the evolving and context-sensitive nature of data practices (Mariani et al., 2018; Baggio, 2016; Razafindrazanakolona et al., 2023). The integration of social media analytics into tourism strategy is not yet standardized, making inductive, field-driven methods more insightful than predefined analytical models (Grasso, 2017).

3. RESULTS AND DISCUSSION

3.1 Real-Time Insights from Social Media Analytics

One of the most prominent findings from interviews with travel business practitioners in Indonesia is the critical role of social media analytics in providing real-time insights into consumer behavior. Respondents emphasized that platforms like Instagram and Twitter serve not only as marketing tools but also as informal sentiment sensors that reflect travelers’ preferences, complaints, and expectations almost instantaneously.

This finding is aligned with Bustamante et al. (2020), who argue that social media-based business intelligence platforms enable tourism firms to dynamically respond to visitor needs and adjust their offerings accordingly. Through tools such as Facebook Insights and Twitter Analytics, tourism marketers are now able to monitor engagement metrics, trending hashtags, and even geolocation data to refine their targeting strategies. These insights are particularly crucial for seasonal promotions or when responding to unexpected changes such as natural disasters or travel restrictions.

Such capability distinguishes smart tourism from traditional tourism approaches. As Baggio (2016) states, the smart tourism paradigm is defined by its responsiveness, personalization, and feedback loops generated through digital interaction. The findings confirm that Indonesian agencies are beginning to adopt this paradigm, although not all have reached full BI integration maturity.

3.2 Strategic Value of BI Systems in Tourism Planning

Interviewees consistently highlighted how BI systems allow for data-informed decision-making that was previously based on assumption or historical trends. For instance, one marketing executive from a Jakarta-based travel agency noted that before implementing BI dashboards, campaign planning was “guesswork”; now, decisions are based on engagement trends, customer profiles, and historical conversion patterns.

This practical transformation echoes the findings by Mariani et al. (2018), who emphasize that tourism actors equipped with BI systems achieve superior operational efficiency and competitive advantage through real-time data utilization. In addition, BI platforms foster strategic alignment between marketing, pricing, and customer service functions that are traditionally siloed in the Indonesian tourism sector.

Moreover, Fly et al. (2008) argue that such data-driven decision-making not only improves internal performance but also contributes to more sustainable travel patterns, as companies can promote less congested destinations or off-peak travel based on real-time demand patterns.

3.3 Enhancing Customer Engagement and Personalization

A notable benefit of BI adoption in tourism, as indicated by participants, is enhanced personalization. Agencies that use social media data can now segment audiences more precisely and tailor travel packages accordingly. A travel agency in Bali, for example, shared how its AI-assisted dashboard enables it to track interactions with surfing-related posts, which then triggers a recommendation system offering surf packages to similar users.

This aligns with Werthner (2003), who posited that intelligent travel systems should replicate a form of "digital empathy," responding to implicit customer desires. Similarly, Stylos and Zwiegelaar (2019) highlight how personalization in BI systems fosters emotional resonance, which is a key driver of brand loyalty and repeat visits.

Furthermore, Grasso (2017) showed that BI systems not only help in understanding demographic differences but also psychographic trends, enabling more sophisticated customer profiling. In the Indonesian market, where generational differences in tech usage are stark, such profiling is essential for effective targeting.

3.4 Challenges and Barriers to BI Adoption

Despite the enthusiasm and clear strategic benefits, several challenges remain in the implementation of BI systems within Indonesia's tourism sector. The most common obstacles cited include lack of analytical skills, financial constraints, and limited understanding of BI's full capabilities.

These barriers are consistent with previous findings by Yulianto et al. (2018), who concluded that many Indonesian travel SMEs perceive BI tools as expensive, complex, and relevant only for large enterprises. Moreover, technical literacy remains a pressing issue, as agency staff are often not trained in data interpretation or dashboard operation.

Serbanescu and Necsulescu (2013) also observed that without sufficient IT infrastructure, BI tools cannot be fully utilized even when data are available. Their study found that travel agencies relying solely on Microsoft Excel or manual methods cannot process large volumes of social media data, thus undermining the scalability of BI.

Another limitation relates to data privacy. Several respondents expressed concerns about using customer data from social platforms, fearing breaches or negative consumer reactions. This reflects what Razafindrazanakolona et al. (2023) termed the "data trust gap," where a lack of clear ethical frameworks restricts the application of otherwise available analytics.

3.5 Localization and Cultural Adaptation in BI Strategies

An unexpected but insightful theme emerged around the localization of BI strategies. Participants reported that BI tools and dashboards developed abroad are often not calibrated to the Indonesian tourism context. For example, certain sentiment analysis tools misinterpret local slang, regional dialects, or cultural expressions prevalent in Indonesian social media.

Dentini (2025) supports this by noting that business intelligence systems developed in Western markets often lack the linguistic nuance needed for accurate analysis in multicultural societies. Therefore, Indonesian travel operators either manually verify outputs or avoid using such tools altogether for customer insight work.

This issue reinforces the importance of culturally adaptive analytics in smart tourism systems. As Baggio (2016) suggested, the true potential of BI in tourism lies not merely in data volume, but in the relevance and accuracy of interpretation. Inaccurate data processing may lead to poor strategy formulation, miscommunication, or misaligned branding.

3.6 Implications for Smart Tourism in Indonesia

The cumulative findings of this study support the thesis that Business Intelligence systems—when properly localized and integrated—can significantly enhance Indonesia's progress toward smart tourism. From data-driven marketing to real-time operational responsiveness, BI analytics sourced from social media offer both tactical and strategic advantages.

Moreover, the results contribute to the theoretical discourse on smart tourism by demonstrating that the BI-social media nexus is not merely a technical tool but also a cultural and communicative framework. In the Indonesian context, where trust, emotion, and identity play major roles in consumer behavior, social media insights offer a uniquely rich repository of affective and behavioral data (Grasso, 2017; Stylos & Zwiegelaar, 2019).

The research also reveals a clear innovation gap between larger urban-based agencies and smaller rural travel businesses. While the former group demonstrates growing sophistication in data

practices, the latter remains largely underserved in BI development. This gap suggests the need for inclusive policies and capacity-building initiatives that democratize access to BI infrastructure across Indonesia.

4. CONCLUSION

This study explored the strategic role of Business Intelligence (BI) systems, particularly social media analytics, in advancing smart tourism within the Indonesian travel industry. Drawing from in-depth interviews and secondary data analysis, the research highlights that social media platforms are not merely promotional tools but serve as critical data sources that, when integrated through BI systems, enable tourism stakeholders to capture real-time insights, personalize offerings, and improve strategic responsiveness.

The findings underscore that Indonesian travel agencies—especially those in urban centers—are beginning to benefit from BI applications that help them detect trends, engage specific customer segments, and refine marketing campaigns based on measurable data. These capabilities support the broader vision of smart tourism as articulated in global literature, where technology enhances service innovation, sustainability, and competitiveness. The ability of BI to enable data-driven decision-making also contributes to more efficient resource allocation and strategic alignment across tourism functions.

Theoretically, this study adds to the emerging discourse on digital transformation in tourism by contextualizing BI within the socio-cultural and infrastructural realities of Indonesia. It demonstrates that BI, when coupled with culturally adaptive analytics, serves not only as a technical instrument but as a dynamic enabler of local knowledge and market responsiveness. These insights bridge the gap between global models of smart tourism and their practical relevance in developing-country settings.

Practically, the research provides actionable insights for tourism operators, policymakers, and platform developers. For travel agencies, the integration of BI dashboards linked with social media tools offers immediate value in understanding consumer behavior and enhancing personalization. For policymakers, the study highlights the need to invest in digital literacy, infrastructure, and ethical guidelines that support inclusive BI adoption. Furthermore, tool developers are encouraged to localize their platforms, ensuring linguistic and cultural sensitivity to Indonesia's diverse social media ecosystem.

However, the study is not without limitations. Its qualitative scope, while rich in depth, limits the generalizability of findings across the entire Indonesian tourism sector. Additionally, the study relied on purposive sampling, which may exclude the perspectives of agencies with lower technological adoption. The exclusion of quantitative performance indicators (e.g., ROI from BI tools) also restricts the ability to measure long-term economic impact.

Future research should consider employing mixed-methods approaches that integrate both qualitative insights and quantitative performance metrics. Comparative studies between regions with differing levels of digital infrastructure could yield a more nuanced understanding of BI diffusion and its scalability. There is also a need for longitudinal studies to evaluate the sustained impact of BI on customer retention, destination management, and crisis response.

In conclusion, this study affirms the growing potential of Business Intelligence in shaping the evolution of smart tourism in Indonesia. By leveraging the real-time and affective power of social media data, BI systems offer a transformative pathway for tourism enterprises to become more adaptive, efficient, and customer-centric in a rapidly digitizing economy.

5. REFERENCES

Baggio, R. (2016). Big Data, Business Intelligence and Tourism: A brief analysis of the literature. *Proceedings of the International Conference on Big Data & Business Intelligence in the Travel & Tourism Sector*.

Baggio, R., Mariani, M., & Fuchs, M. (2018). Business intelligence and big data in hospitality and tourism: A systematic literature review. *International Journal of Contemporary Hospitality Management*, *30*(10), 2803–2821. https://doi.org/10.1108/IJCHM-07-2017-0461

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Bustamante, A., Sebastia, L., & Onaindia, E. (2020). BITOUR: A business intelligence platform for tourism analysis. *ISPRS International Journal of Geo-Information*, *9*(11), 681.

Chircu, A. M. (2006). IT and Business Process Change in Corporate Travel: Implications for Business Intelligence. *Journal of Information Systems*.

Dentini, A. (2025). Travel analytics for business intelligence: the case of Italian Institute of Statistics. *Rivista Italiana di Economia Demografia e Statistica*.

Fly, R. H., Couzens, N., & Wilson, G. (2008). Measuring the environmental impact of travel: Business intelligence for informed travel choice. *The Travel & Tourism Competitiveness Report*.

Grasso, E. (2017). The importance of digital tools for business travel. *Politecnico di Milano Thesis*.

Hamilton, J. R., & Selen, W. (2008). A multi-agent business intelligence framework for the travel sector. *Communications of the Association for Information Systems*, *22*, Article 31.

Harms, T. (2018). Benefits and barriers of self-service business intelligence implementation in micro-enterprises: A case of ABC Travel & Consulting [Master's thesis, ProQuest].

Hellman, M. (2016). Improving traveling habits using an OLAP cube: Development of a business intelligence system [Master's thesis, DIVA portal].

Höpken, W., & Fuchs, M. (2016). Introduction: Special issue on business intelligence and big data in the travel and tourism domain. *Information Technology & Tourism*, *16*(1), 1–4.

Mariani, M., Baggio, R., Fuchs, M., & Höpken, W. (2018). Business intelligence and big data in tourism and hospitality: A systematic literature review. *International Journal of Hospitality Management*, *76*, 78–90.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis* (2nd ed.). Sage Publications.

Mukherjee, S., Ghosh, B., & Sitaraman, K. (2013). Understanding patterns and structures in data—Analytics and Machine Learning and application to Travel Industry. *ResearchGate*.

Razafindrazanakolona, A. D., Raharijaona, A., & Rajaonah, R. (2023). Use of Big Data and Business Intelligence Platforms to Boost the Tourism and Travel Sector in the Province of Fianarantsoa, Madagascar. *BIAR: Scientific Journal of Informatics, Technology and Engineering*, *4*(2), 1–10.

Roddis, P. (2019). Travel Data Analysis 3.0 [Master's Thesis, Theseus].

Schmittem, J. (2021). *Data-driven travel marketing: The importance of business intelligence for affiliate marketing in the travel industry*. Springer.

Serbanescu, L., & Necsulescu, C. (2013). Improving the performance and efficiency of travel agencies with IT technology. *Lucrări Ştiinţifice Management Agricol*, *15*(1), 315–320.

Stylos, N., & Zwiegelaar, J. (2019). Big data as a game changer: How does it shape business intelligence within a tourism and hospitality industry context? In *Big Data and Innovation in Tourism, Travel, and Hospitality* (pp. 15–32). Springer.

Visuwasam, L. M. M., & Raj, D. P. (2020). A distributed intelligent mobile application for analyzing travel big data analytics. *Peer-to-Peer Networking and Applications*, *13*, 1039–1050.

Werthner, H. (2003). Intelligent systems in travel and tourism. *International Joint Conference on Artificial Intelligence* (IJCAI), *3*, 1620–1625.

Wikström, D., Brandt, D., & Heldt, T. (2016). A business intelligence solution of handling traveling data with R and Shiny. *DIVA Portal Extended Abstracts*.

Ygnacio, L. A. V., Retuerto, M. G., & Romero, P. J. M. (2023). Mobile application with business intelligence to optimize the control process of tourist agencies. *Revista Ibérica de Sistemas e Tecnologias de Informação*, *47*, 214–222.

Yulianto, M., Girsang, A. S., & Pratama, A. (2018). Business intelligence for social media interaction in the travel industry in Indonesia. *Journal of Intelligence Research*, *6*(1), 45–52.

Yuliani, E. N. S., Subawanto, H., & Santoso, H. (2017). Business Intelligence dashboard implementation on a travel agency in Jakarta. *International Journal of Data Science*, *2*(3), 33–39.

Zwiegelaar, J., & Stylos, N. (2018). The impact of new technologies on the business travel market. *Springer*.