

DEVELOPING A BUSINESS MODEL CANVAS FOR ECO-TOURISM : INTEGRATING DESIGN THINKING AND DIGITAL MARKETING FOR SUSTAINABILITY

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ABSTRACT

Ecotourism destinations in Indonesia continue to face challenges in aligning environmental stewardship, community participation, and sustainable business practices, particularly in rural sites such as Tebing Koja. This study aims to develop an integrated and sustainability-oriented business model by combining stakeholder insights, visitor perceptions, and strategic innovation through the Business Model Canvas (BMC), Design Thinking, and digital marketing approaches. The findings reveal that visitors highly depend on digital information clarity, social media visibility, and online ticketing convenience, highlighting the essential role of digital marketing in shaping destination trust and attractiveness. Stakeholder insights simultaneously emphasize needs related to safety, facility quality, environmental education, and inclusive community involvement. Quantitative results from 100 visitors confirm the strong influence of Digital Marketing and Design Thinking on Business Model Innovation, with innovation serving as a key driver of ecotourism sustainability. Mediation analysis further shows that innovative business practices significantly strengthen the impact of digital engagement and visitor-centered insights on sustainable outcomes. The integrated findings support the development of a comprehensive BMC tailored for Tebing Koja, outlining clear value propositions, customer segments, operational priorities, and partnership strategies. Overall, this study demonstrates that sustainability in rural ecotourism emerges not only from ecological preservation but also from digital readiness, human-centered design, and collaborative business innovation, offering a practical roadmap for strengthening destination competitiveness and long-term socio-environmental value.

Keywords : Ecotourism Sustainability; Business Model Canvas; Design Thinking; Digital Marketing

ABSTRAK

Penelitian ini bertujuan mengembangkan model bisnis berkelanjutan untuk destinasi ekowisata Tebing Koja dengan mengintegrasikan Business Model Canvas (BMC), Design Thinking, dan strategi digital marketing. Temuan menunjukkan bahwa wisatawan sangat bergantung pada kejelasan informasi digital, visibilitas media sosial, dan kemudahan tiket daring, sehingga digital marketing menjadi elemen penting dalam membangun kepercayaan dan minat kunjungan. Di sisi lain, wawasan dari pengelola dan masyarakat menekankan kebutuhan akan keselamatan, peningkatan fasilitas, edukasi lingkungan, serta pelibatan komunitas secara adil. Hasil survei terhadap 100 wisatawan mengonfirmasi bahwa Digital Marketing dan Design Thinking berpengaruh positif terhadap Business Model Innovation, sementara inovasi model bisnis berperan sebagai pendorong utama keberlanjutan ekowisata. Analisis mediasi menunjukkan bahwa inovasi memperkuat pengaruh strategi digital dan wawasan berbasis pengguna terhadap capaian keberlanjutan. Integrasi temuannya menghasilkan BMC komprehensif untuk Tebing Koja yang memuat proposisi nilai, segmen pelanggan, aktivitas kunci, dan strategi kolaborasi. Secara keseluruhan, penelitian ini menegaskan bahwa keberlanjutan dalam ekowisata tidak hanya bertumpu pada konservasi,

tetapi juga pada kesiapan digital, desain berpusat pada manusia, dan inovasi model bisnis yang kolaboratif.

Kata Kunci : Keberlanjutan Ekowisata; Kanvas Model Bisnis; Pemikiran Desain; Pemasaran Digital

INTRODUCTION

Indonesia's ecotourism sector has grown steadily over the past decade as the country positions its natural wealth rainforests, volcanic landscapes, and marine ecosystems as strategic assets for sustainable development. Recent studies highlight that Indonesia is among the world's top megadiverse countries, yet tourism pressure in fragile ecosystems continues to rise (Djuwendah et al., 2023; Grimm et al., 2018; Scott, 2021). Although ecotourism is promoted as a vehicle for conservation and community empowerment, evidence shows that many destinations still face environmental stress, waste management issues, and limited ecological monitoring. These challenges become more visible as domestic ecotourism demand increases, especially after the pandemic recovery period when nature-based travel surged nationwide (Ashraf et al., 2020; Newsome & Perera, 2023). Consequently, Indonesia urgently needs governance frameworks and business models that ensure ecotourism growth does not compromise ecological integrity.

At the same time, scholars argue that the sustainability of ecotourism depends not only on environmental safeguards but also on how well local communities participate and benefit economically (Pramono & Juliana, 2025). Studies in several Indonesian ecotourism villages show that community-based tourism initiatives remain uneven, with gaps in revenue distribution, digital promotion capability, and long-term destination planning. Without structured business strategies, many sites struggle to maintain service quality, reinvest in conservation, and compete with commercial mass tourism. This indicates that sustainable ecotourism requires not only ecological stewardship but also innovation in business design, strategic marketing, and visitor-experience management (Wiyono et al., 2023). Therefore, strengthening ecotourism in Indonesia demands an integrated approach that aligns environmental responsibility, community empowerment, and sustainable business modeling.

Tebing Koja's current management structure still reflects the common challenges found in Indonesia's emerging ecotourism sites, where value creation remains inconsistent due to informal operations and the absence of a standardized business model. Studies show that community-based tourism destinations without a clear business design struggle to optimize visitor value, distribute benefits fairly, and maintain service quality (Jaya et al., 2024). Moreover, research on nature-based tourism sustainability highlights that destinations with unclear organizational roles and weak financial planning often fail to translate natural assets into sustained economic value (Selawaty et al., 2024; Sthapit et al., 2023). These issues are

exacerbated by limited local capacity for structured planning, resulting in fragmented visitor experiences and underdeveloped revenue opportunities. As a consequence, Tebing Koja faces challenges in converting its scenic attractiveness into long-term socio-ecological value.

The Business Model Canvas (BMC) is highly relevant for improving Tebing Koja's business model because it offers a structured and visual framework that aligns value creation, customer segments, and key operational elements into a coherent strategic design (Setiawan et al., 2021). Recent studies on digital and tourism business modeling emphasize that destinations must redesign their value propositions and delivery mechanisms to remain competitive in rapidly evolving tourism ecosystems (Ammirato et al., 2022). Research on co-creation in tourism further shows that structured models like BMC enable destinations to integrate stakeholder collaboration, innovation, and service design more effectively (Dickinger & Kolomojets, 2024). At the same time, analyses of value co-destruction highlight that tourism sites without clear business logic and customer alignment are more vulnerable to inconsistent experiences and operational inefficiency (Sthapit et al., 2023). Complementary studies on digital transformation reveal that modernizing channels, customer relationships, and revenue mechanisms through a structured business model is essential for sustaining tourism competitiveness and environmental resilience (Gutierriz et al., 2025). Together, these insights show that BMC provides a robust foundation for redesigning Tebing Koja's business model toward sustainability, digital readiness, and higher value creation.

Design Thinking is particularly valuable for understanding what visitors and local stakeholders genuinely need at Tebing Koja because it begins with empathy listening closely, observing carefully, and uncovering expectations that are often not expressed in surveys or routine management discussions. In sustainable hospitality settings, this approach has proven effective for revealing how people actually interact with services and for guiding the creation of practical prototypes that fit real user behaviors (Ranti & Lee, 2023). Within tourism entrepreneurship, Design Thinking also helps communities and service providers co-create solutions that balance economic goals with social and environmental responsibilities, which is essential for destinations rooted in local culture and natural beauty (Mahato et al., 2021). Recent sustainability research further highlights that Design Thinking enables destinations to navigate complexity by encouraging collaborative dialogue, iterative refinement, and creativity grounded in real-world needs (Leal Filho et al., 2024).

Digital marketing plays a crucial role in promoting sustainability in tourist destinations by enabling more efficient, targeted, and engaging communication with travelers, stakeholders, and the broader public. Through social media, content marketing, and digital branding, destinations can raise awareness about environmental values, responsible behaviors, and

conservation efforts, thereby fostering a more sustainable travel culture (Rosário & Dias, 2025). Moreover, digital marketing capabilities help tourism organizations particularly local governments and community-based enterprises enhance operational efficiency and strengthen destination branding, which supports both economic growth and environmental stewardship (Badari et al., 2024). Research indicates that digital campaigns can guide tourists toward under-visited or ecologically sensitive areas, reducing overtourism in traditional hotspots while distributing benefits more equitably (Sanjaya et al., 2024).

Although research on sustainable tourism has expanded, studies applying the Business Model Canvas specifically to rural or village-based eco-tourism remain limited, with most BMC analyses focusing on conventional tourism businesses or urban hospitality settings (Andrianto et al., 2022). At the same time, scholarly work integrating the Business Model Canvas with Design Thinking frameworks is still scarce, even though both approaches are increasingly recognized as complementary tools for fostering innovation and stakeholder-centered value creation in tourism (Kurek et al., 2023; Tantiyaswasdikul, 2024). Moreover, quantitative examinations of tourist perceptions regarding eco-tourism value such as authenticity, environmental responsibility, and experience quality are underrepresented, with existing studies predominantly relying on qualitative insights or small-scale case studies (Gu et al., 2020; Kim & Park, 2017). These gaps collectively indicate a need for research that adapts BMC to rural eco-tourism, integrates Design Thinking, and incorporates quantitative visitor assessments to strengthen the evidence base for sustainable destination development.

Theoretically, this study enriches the existing literature by offering a fresh, integrative perspective that brings together the Business Model Canvas, Design Thinking, and digital marketing three approaches that have each gained scholarly attention but are rarely explored as a unified framework. Recent work on sustainable business models highlights the importance of blending value creation tools with user-centered insights and digital transformation, yet such integration remains conceptually fragmented (Kurek et al., 2023; Lüdeke-Freund et al., 2018). In eco-tourism specifically, researchers continue to emphasize the need for business models that reflect sustainability principles, but most frameworks still overlook the unique realities of rural and nature-based destinations (Bocken & Geradts, 2020). By incorporating a quantitative assessment of visitor value propositions, this study also addresses the limited empirical understanding of how tourists perceive environmental authenticity and sustainable experience design (Tussyadiah, 2020).

Practically, this study offers direct value to the management of Tebing Koja by presenting a clear and actionable business model blueprint that reflects the needs of visitors, local communities, and destination managers. The integration of Design Thinking ensures that

the model is grounded in real human experiences, allowing stakeholders to understand what tourists truly appreciate and what local residents expect from tourism activities. The inclusion of digital marketing strategies is equally important, as research shows that destinations that embrace data-driven digital communication are better positioned to strengthen visibility, attract the right market segments, and support sustainable behaviors among visitors (Khan et al., 2022). Digital transformation studies also reveal that online platforms can help destinations convey environmental messages more effectively and adapt to shifting traveler preferences (Cheng et al., 2023). These practical contributions provide Tebing Koja with a comprehensive roadmap for enhancing competitiveness, improving sustainability practices, and creating more meaningful engagement with tourists and the community

LITERATURE REVIEW

Eco-Tourism Sustainability

Ecotourism sustainability refers to the ability of a nature-based tourism destination to balance environmental protection, community well-being, and economic viability in a long-term and responsible manner. At its core, sustainable ecotourism is grounded in the idea that tourism should enrich rather than exploit natural and cultural resources, while ensuring that local communities meaningfully participate and benefit from the development process. This includes conserving biodiversity, fostering environmental awareness among visitors, promoting responsible traveler behavior, and creating livelihood opportunities that strengthen community resilience. Recent Scopus-indexed research highlights that sustainable ecotourism thrives when destinations integrate conservation practices, community empowerment, and innovative management strategies that support both ecological integrity and visitor experience quality (Holladay, 2018; Hu et al., 2022; Kunjuraman, 2022). By combining protection, education, and inclusive economic benefits, ecotourism sustainability provides a holistic foundation for destinations to grow in ways that honor both nature and the people who depend on it.

Business Model Canvas

The Business Model Canvas (BMC) is widely recognized as a practical and intuitive framework that helps organizations clearly understand how they create value for their customers and how that value is delivered and sustained. Introduced by Osterwalder & Pigneur (2010), the BMC breaks down a business into nine connected elements ranging from who the customers are, to what value is being offered, to the activities, partners, and resources that make the whole system work. What makes the BMC especially valuable is its ability to simplify complex business ideas into a single, visual map, making it easier for teams to explore opportunities, discuss improvements, and innovate together. Recent studies in the tourism and hospitality field highlight how useful the BMC is for destinations and service providers facing rapid shifts in

visitor behavior and digital expectations, as it helps align value creation with changing market and sustainability demands (Reinhold et al., 2017). Other research also shows that the BMC supports more collaborative and forward-looking planning by making it clearer where partnerships, cost efficiencies, or new revenue opportunities can emerge. In this way, the BMC becomes not just a template, but a guide for building more resilient, innovative, and sustainable business models especially in dynamic sectors like eco-tourism.

Design Thinking

Design Thinking is a human-centered approach to innovation that encourages organizations to deeply understand the needs, emotions, and behaviors of the people they serve. The process typically unfolds through five interconnected stages: Empathize, Define, Ideate, Prototype, and Test, each designed to help teams move from understanding a problem to creating meaningful solutions. The Empathize stage invites practitioners to listen and observe closely, uncovering real user frustrations and aspirations. These insights are synthesized in the Define stage, where problems are reframed in a clear and actionable way. Ideate encourages creativity and divergent thinking to explore a wide range of possibilities before narrowing them into promising concepts. In the Prototype stage, ideas are shaped into tangible forms that users can interact with, and the Test stage gathers feedback to refine or redesign the solution. Recent research highlights that Design Thinking fosters collaboration, creativity, and deeper user alignment, making it especially valuable in service industries such as tourism, hospitality, and sustainability-focused development (Micheli et al., 2019; Verganti et al., 2021). Overall, Design Thinking helps organizations move beyond assumptions by grounding innovation in real human experiences, allowing solutions to become more empathetic, adaptive, and impactful.

Digital Marketing

Digital marketing refers to the strategic use of online platforms, digital tools, and interactive technologies to communicate value, build relationships, and influence consumer decisions. Unlike traditional marketing, digital marketing enables real-time engagement through social media, search engines, mobile applications, websites, and user-generated content, allowing organizations to create more personalized and immersive experiences. In the tourism context, digital marketing plays a powerful role in shaping destination image, guiding visitor expectations, and facilitating seamless interactions before, during, and after the trip. Through compelling storytelling, visual content, and two-way communication, destinations can inspire emotions, build trust, and strengthen visitor loyalty. Recent Scopus-indexed studies show that digital marketing significantly affects tourist behavior, enhances destination competitiveness, and supports sustainable tourism by encouraging responsible travel and community engagement (Almeida-Santana et al., 2020; Kumar et al., 2024). With its ability to reach wide audiences

quickly and meaningfully, digital marketing has become a cornerstone for modern tourism development helping destinations remain visible, relevant, and connected to visitor needs in an increasingly digital world.

RESEARCH METHODS

Method is a method of work that can be used to obtain something. While the research method can be interpreted as a work procedure in the research process, both in searching for data or disclosing existing phenomena (Zulkarnaen, W., Amin, N. N., 2018). This study employs a sequential exploratory mixed-method design to generate a comprehensive understanding of stakeholder needs and visitor perceptions in developing a sustainable business model for Tebing Koja. The qualitative phase begins with a Design Thinking approach involving 5 participants representing site managers, local community members, and tourists, using in-depth interviews, field observations, and empathy-based tools such as personas and empathy maps. Insights from this phase inform the construction of a quantitative survey administered to 100 tourists using purposive sampling, focusing on perceived eco-tourism value, digital marketing engagement, and overall visitor experience measured through Likert-scale items. The combination of exploratory qualitative insights and subsequent quantitative measurement ensures that the model is grounded in both lived experiences and broader visitor trends.

The qualitative data are analyzed through coding and thematic analysis to identify core themes related to visitor motivations, experience gaps, and stakeholder expectations, forming the basis for early Design Thinking synthesis. Quantitative data from the 100 tourist responses then undergo validity and reliability testing, followed by descriptive analysis and optional regression or SEM to explore the relationships among eco-tourism value perception, digital engagement, and experience quality. These combined findings feed into the final stage, where a Business Model Canvas tailored for Tebing Koja is constructed and validated. The resulting research model illustrates the integrated flow from Design Thinking exploration, to survey-based confirmation, to the final BMC formulation providing a structured pathway for designing a sustainability-driven eco-tourism business strategy.

RESULTS AND DISCUSSION

Qualitative Findings

The qualitative exploration using the Design Thinking approach provided a clear picture of what tourists, managers, and local communities experience at Tebing Koja. Through interviews, observations, and empathy tools, several key needs, challenges, and opportunities were identified. These insights were organized into the Empathy, Define, and Ideate stages, offering a concise foundation for improving the destination's business model.

The qualitative findings derived from the Design Thinking process reveal a comprehensive understanding of the needs, expectations, and challenges faced by visitors, managers, and the local community at Tebing Koja. The Empathy stage highlights that tourists require clear digital information, safe photo spots, and educational experiences, while simultaneously expressing concerns about inconsistent online data, limited signage, and cleanliness issues. Managers emphasize the need for a structured business model, digital marketing strategy, and operational standards, whereas the community seeks fair economic opportunities and greater involvement in tourism activities. These insights lead to the Define stage, which identifies key problems such as inconsistent visitor experiences, lack of a formal business model, insufficient facilities, weak digital presence, and uncoordinated community engagement. In response, the Ideate stage proposes various solutions including digital information enhancements, eco-tourism value offerings, improved facilities, strengthened business model components, and community empowerment initiatives. Stakeholder insights further validate the importance of collaboration, professional management, and visitor-centered improvements, underscoring the relevance of integrating digital strategies and sustainable practices to enhance Tebing Koja's overall tourism performance.

Quantitative Findings

The respondent profile in this study is based on data collected from 100 visitors of Tebing Koja, representing various demographic backgrounds, educational levels, visit motivations, and digital behaviors. These characteristics provide an essential foundation for understanding visitor preferences and evaluating the factors that influence their perception of eco-tourism value and digital engagement.

The profile of the 100 respondents in this study reflects a diverse group of visitors to Tebing Koja, dominated slightly by female participants (55%) and primarily within the young adult age range of 17-35 years (72%), indicating a strong appeal of the destination to younger, active travelers. Most respondents hold a bachelor's degree (50%) and are either students (30%) or private employees (28%), suggesting that the destination attracts both learners and working professionals seeking leisure and exploration. A majority were first-time visitors (62%), showing that Tebing Koja continues to draw new interest, supported by the fact that social media serves as the main source of information (56%). Visitor motivations are largely centered on nature scenery and photography (48%) and relaxation (27%), highlighting the destination's strengths in visual appeal and natural ambiance.

All indicators across the four variables demonstrate strong validity, with outer loading values above 0.70. Digital Marketing items show solid performance, indicating that visitors highly value clear digital information, engaging online content, and convenient online services.

Design Thinking indicators also load well, reflecting that users perceive the destination as responsive and driven by creativity and feedback. Business Model Innovation presents the strongest loadings overall, showing that visitors clearly recognize innovative value, activities, partnerships, and revenue models. Ecotourism Sustainability indicators are also valid, confirming that environmental conservation, community impact, education, responsible behavior, financial stability, and stakeholder collaboration are well represented.

The reliability and validity results show that all variables meet the required standards for internal consistency and construct validity. Cronbach's alpha values for all constructs Digital Marketing (0.837), Design Thinking (0.833), Business Model Innovation (0.947), and Ecotourism Sustainability (0.873) are well above the acceptable threshold of 0.70, indicating strong reliability. The AVE values, ranging from 0.600 to 0.792, also exceed the minimum criterion of 0.50, confirming that each construct demonstrates adequate convergent validity.

The direct effect analysis demonstrates that all hypothesized relationships are statistically significant, as indicated by p-values below 0.05 and t-statistics well above the critical threshold. Digital Marketing ($\beta = 0.427$) and Design Thinking ($\beta = 0.450$) both show strong positive effects on Business Model Innovation, confirming their important role in driving innovation within the destination's business model. Business Model Innovation itself exhibits the strongest influence on Ecotourism Sustainability ($\beta = 0.618$), highlighting its central role in strengthening long-term environmental, social, and economic outcomes. Additionally, both Digital Marketing ($\beta = 0.159$) and Design Thinking ($\beta = 0.180$) have direct positive impacts on Ecotourism Sustainability, indicating that user-centered service design and effective digital engagement contribute independently to sustaining eco-tourism performance.

The indirect effect results indicate that Business Model Innovation significantly mediates the relationship between both Digital Marketing and Design Thinking toward Ecotourism Sustainability. Digital Marketing shows a positive and significant indirect effect on sustainability ($\beta = 0.267$, $p = 0.003$), suggesting that its contribution becomes stronger when channeled through innovative business model practices. Similarly, Design Thinking also exhibits a substantial mediated effect ($\beta = 0.275$, $p = 0.000$), reflecting that user-centered insights and creative problem-solving translate into higher sustainability outcomes when integrated into business model improvements.

The PLS-SEM output illustrates strong measurement and structural model performance across all constructs. The outer loadings for each indicator exceed the 0.70 threshold, confirming good indicator reliability for Digital Marketing, Design Thinking, Business Model Innovation, and Ecotourism Sustainability. The latent variable reliability values shown within the blue circles (0.837, 0.833, 0.947, and 0.873) indicate high internal consistency. The

structural paths demonstrate significant positive relationships: Digital Marketing and Design Thinking both influence Business Model Innovation, and all three variables directly and indirectly contribute to Ecotourism Sustainability. The strongest pathway is from Business Model Innovation to Ecotourism Sustainability (0.620), emphasizing its mediating role.

The integration of qualitative and quantitative findings provides a more complete picture of what visitors truly need and how Tebing Koja can respond. The need for accurate digital information revealed during interviews aligns strongly with what the survey showed: most visitors depend on social media, online reviews, and clear digital navigation before deciding to visit. This overlap strengthens the conclusion that digital presence is not just a promotional tool but a fundamental part of the visitor experience. The combination of field insights and survey responses also highlights how important safety, comfort, and nature-based learning are for today's travelers. Tourists frequently mentioned the desire for safe photo spots and educational narratives, while the survey confirmed that scenery, photography, and relaxation are primary motivations. When seen together, these findings show that enhancing safety and improving experiential storytelling can significantly elevate visitor satisfaction.

Community involvement also emerged as a powerful theme across both datasets. Local residents expressed their hopes for fair participation and more opportunities, while visitors showed clear interest in cultural elements and authentic interactions. This shared perspective reinforces the idea that community-driven programs, guided tours, and local storytelling can become distinguishing features that set Tebing Koja apart from other destinations. Finally, the study highlights the need for more structured management and professional operations. Managers voiced concerns about unclear roles and the lack of a unified business model, while survey respondents emphasized the importance of transparency, especially through digital ticketing and organized service flow. By aligning these operational needs with visitor expectations, Tebing Koja can build a more reliable, competitive, and sustainable eco-tourism business model one that honors both people and nature.

Business Model Canvas

The finalized Business Model Canvas for Tebing Koja provides a structured overview of how the destination creates, delivers, and captures value within the eco-tourism ecosystem. This framework integrates insights from visitors, local communities, and destination managers, allowing each component from value propositions to partnership networks to reflect real needs and opportunities observed in the field. The BMC not only highlights the current strengths of Tebing Koja but also outlines strategic directions that can support long-term sustainability, community empowerment, and a more engaging experience for future visitors.

The Business Model Canvas for Tebing Koja paints a clear picture of how the

destination can grow into a more meaningful and sustainable eco-tourism site. At its core, the model is built around what visitors genuinely look for when they come: a beautiful natural landscape, safe and comfortable spaces to enjoy it, and a chance to learn something about the environment and the local community. These value propositions reflect the real emotions and expectations expressed by travelers wanting not just good photos, but good experiences. To deliver this value, the BMC recognizes several groups of visitors, from young travelers who discover destinations through Instagram and TikTok, to families seeking affordable outdoor recreation, to school groups hoping for environmental learning. Because each group learns and decides differently, the model highlights the need for strong digital visibility clear social media content, accurate Google Maps information, and an official microsite that feels trustworthy and easy to navigate.

Relationships with visitors are also placed at the center. Friendly staff, transparent e-ticketing, and simple feedback tools help create a sense of connection and trust. Meanwhile, community-guided tours offer something more personal: a way for visitors to feel welcomed by the people who know Tebing Koja best. This not only enriches the visitor experience but also ensures that local residents become active participants in shaping the future of their own destination. Behind the scenes, the model outlines the essential activities and partners needed to make everything work from maintaining the natural environment, to producing engaging digital content, to training local guides and vendors. By collaborating with schools, local SMEs, environmental groups, and influencers, Tebing Koja can build a support system that strengthens both its operational capacity and community well-being. The revenue streams and cost structure reflect a practical approach, ensuring that the destination stays financially healthy while still investing in nature conservation, improved facilities, and local empowerment.

DISCUSSION

The findings show that digital marketing plays a central role in shaping visitors' perceptions, expectations, and overall satisfaction at Tebing Koja. Clear digital information, engaging social media content, and convenient online ticketing strongly influence how visitors evaluate the destination even before they arrive. This aligns with recent tourism studies emphasizing that digital touchpoints have become decisive factors in destination choice and trust-building (Almeida-Santana et al., 2020 Almeida). For a visually driven attraction like Tebing Koja, digital presence is not merely promotional it becomes part of the value offering, helping visitors feel informed, prepared, and emotionally connected to the place.

Visitor needs also highlight the importance of human-centered improvements: safety in photo spots, clear signage, meaningful storytelling, and consistent cleanliness. These expectations reflect a desire for both emotional comfort and functional convenience during the

visit. The emphasis on user experience resonates with studies showing that visitor-centered service design fosters deeper value creation and enhances perceived authenticity in tourism (Mahato et al., 2021). When the destination responds to these needs through better facilities, environmental education, and reliable information it strengthens not only satisfaction but also long-term loyalty and positive word-of-mouth.

The pattern of findings also underscores the pivotal role of business model innovation. Improvements such as transparent digital ticketing, collaborations with local SMEs, community-led tours, and diversified tourism products create a more structured and resilient operational foundation. These elements echo global research demonstrating that innovative business models enhance destination competitiveness, visitor experience quality, and environmental responsibility (Andrianto et al., 2022). At Tebing Koja, innovation is visible in everyday practices from how the site is maintained to how visitors engage with local culture and nature showing that small adjustments in design and management can generate meaningful long-term impact.

Taken together, these insights highlight that sustainability at Tebing Koja is shaped by a synergy of digital strength, human-centered improvements, and innovative business operations. Environmental stewardship, visitor education, and community empowerment emerge as interconnected components that reinforce one another. This perspective aligns with contemporary sustainable tourism literature, which emphasizes that genuine sustainability arises when destinations integrate environmental care, local participation, and adaptive management strategies (Della Corte et al., 2021). Ultimately, the journey toward sustainability at Tebing Koja is a story about people how they search, how they feel, what they value and how thoughtful design and innovation can turn those insights into a more meaningful and enduring tourism experience.

CONCLUSION

This study reveals that the sustainability of Tebing Koja grows strongest when digital connection, human understanding, and creative business thinking come together. Visitors today rely heavily on digital information to feel confident and excited before they visit, and when the destination provides clear and engaging online content, it naturally builds trust and anticipation. At the same time, listening closely to what visitors need such as safety, clarity, comfort, and meaningful stories helps the destination shape experiences that feel personal and memorable. These insights, when transformed into innovative business practices like digital ticketing, guided eco-experiences, and community partnerships, create a more solid and future-ready foundation for the destination. Ultimately, sustainability here is not just about protecting nature; it is about people working together managers, visitors, and the local community to create a place

that feels cared for, inspiring, and worth returning to. Tebing Koja's journey shows that when empathy, innovation, and digital presence support each other, ecotourism can thrive in a way that is both responsible and deeply meaningful.

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GAMBAR, GRAFIK DAN TABEL

Table 1. Qualitative Findings (Design Thinking)

Stage	Category	Key Findings
Empathy	Tourist Needs	a. Clear digital information (routes, prices, facilities) b. Safe and well-maintained photo spots c. Accurate digital access (Google Maps, social media presence)
	Tourist Expectations	a. Authentic natural experience b. Adequate basic facilities (toilets, shaded areas) c. Educational narratives about nature and local culture
	Tourist Complaints	a. Inconsistent online information b. Lack of signage and interpretation boards c. Poor cleanliness and parking management
	Manager Needs	a. A standardized business model and clear role distribution b. Effective digital marketing strategy c. Service SOPs and operational standards
	Community Needs	a. Fair access to economic opportunities b. Hospitality training c. More structured involvement in tourism activities
Define	Core Problems	a. Inconsistent visitor experience b. Absence of a formal business model and role clarity c. Limited supporting facilities d. Weak digital presence

		e. Unstructured community involvement
Ideate	Digital Information Solutions	a. Destination website/microsite b. Optimized Google Business profile c. Storytelling content on nature and culture
	Eco-tourism Value Solutions	a. Environmental education boards• Guided interpretive tours b. “Eco-experience” packages (trekking, photography)
	Facility Improvement Ideas	a. Safe photo spots b. Shaded rest areas c. Improved pedestrian paths and parking layout
	Business Model Solutions	a. Clear role-sharing between managers and community b. Transparent digital ticketing c. Partnerships with local SMEs and community groups
	Community Empowerment Ideas	a. Training for guiding and hospitality b. Local product and culinary stands c. Community participation forums
Stakeholder Insights	Management	a. Need a clear business model and digital strategy b. Desire more professional operations but limited capacity c. Need stronger collaboration with the community
	Local Community	a. Highly willing to participate but need training b. Expect fair economic benefits c. Support development of educational tourism
	Tourists	a. Want safe, informative, and structured experiences b. Strongly influenced by digital information before visiting c. Attracted to environmental education and preserved landscapes

Source: Processed Data, 2025

Table 2. Characteristics of Respondents

Category	Sub-category	Percentage	Total (n)
Gender	Male	45%	45
	Female	55%	55
Total Gender		100%	100
Age Group	17-25 years	38%	38
	26-35 years	34%	34
	36-45 years	18%	18
	>45 years	10%	10
Total Age Group		100%	100
Education Level	Senior High School	22%	22
	Diploma	15%	15
	Bachelor’s Degree	50%	50
	Postgraduate	13%	13
Total Education Level		100%	100
Occupation	Students	30%	30
	Private Employees	28%	28
	Entrepreneurs	18%	18
	Government Employees	10%	10
	Others	14%	14
Total Occupation		100%	100
Frequency of Nature Tourism Visits	First-time Visitors	62%	62

	2–3 times per year	27%	27
	>3 times per year	11%	11
Total Frequency		100%	100
Information Source	Social Media	56%	56
	Friends/Word of Mouth	24%	24
	Google Search/Maps	15%	15
	Others	5%	5
Total Information Source		100%	100
Visit Motivation	Nature Scenery & Photography	48%	48
	Relaxation/Leisure	27%	27
	Education/Enrichment	15%	15
	Family Recreation	10%	10
Total Motivation		100%	100

Source: Processed data, 2025

Table 3. Outer Loading

Variable	Indicator	Outer Loading	Information
Digital Marketing	Digital information about the destination is clear	0.734	Valid
	Social media makes me interested in visiting	0.741	Valid
	Online content increases my attraction to the destination	0.793	Valid
	Online ticketing is convenient	0.795	Valid
	The destination has a strong digital presence	0.816	Valid
Design Thinking	The destination understands visitor need	0.738	Valid
	The services solve key visitor problems	0.788	Valid
	The destination offers creative ideas	0.748	Valid
	Visitor feedback is used for improvement	0.855	Valid
	The destination adapts to user experience needs	0.738	Valid
Business Model Innovation	The destination offers unique value	0.906	Valid
	The destination targets visitor segments well	0.887	Valid
	New activities improve the experience	0.924	Valid
	The destination collaborates with partners	0.875	Valid
	The destination has innovative revenue sources	0.852	Valid
	The operations support continuous innovation	0.894	Valid
Ecotourism Sustainability	The destination supports environmental conservation	0.803	Valid
	Tourism benefits the local community.	0.728	Valid
	The destination provides educational value	0.736	Valid
	Visitors are encouraged to behave responsibly	0.901	Valid
	The destination is financially sustainable	0.791	Valid
	Stakeholders collaborate effectively	0.734	Valid

Source: Processed data, 2025

Table 4. Reliability and Validity

Variable	Cronbach's alpha	AVE	Information
Digital Marketing	0.837	0.603	Reliability
Design Thinking	0.833	0.600	Reliability
Business Model Innovation	0.947	0.615	Reliability
Ecotourism Sustainability	0.873	0.792	Reliability

Source: Processed data, 2025

Table 5. Direct Effect

Direct Effect	Sample Mean	Standard Deviation	T-Statistic	P-Values	Conclusion
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Digital Marketing > Business Model Innovation	0.427	0.115	3.715	0.000	Accepted
Design Thinking > Business Model Innovation	0.450	0.105	4.229	0.000	Accepted
Business Model Innovation > Ecotourism Sustainability	0.618	0.087	7.145	0.000	Accepted
Digital Marketing > Ecotourism Sustainability	0.159	0.077	2.073	0.038	Accepted
Design Thinking > Ecotourism Sustainability	0.180	0.085	2.084	0.037	Accepted

Source: Processed data, 2025

Table 6. Indirect Effect

Indirect Effect	Sample Mean	Standard Deviation	T-Statistic	P-Values	Conclusion
Digital Marketing > Business Model Innovation > Ecotourism Sustainability	0.267	0.090	2.935	0.003	Accepted
Design Thinking > Business Model Innovation > Ecotourism Sustainability	0.275	0.065	4.272	0.000	Accepted

Source: Processed data, 2025

Table 7. Integration of Qualitative - Quantitative Findings

Aspect	Qualitative Findings (Design Thinking)	Quantitative Findings (Survey, n=100)	Integrated Insight / Strengthened Value Proposition
Information Clarity & Digital Presence	Tourists need accurate online information, consistent pricing, and clear navigation; strong demand for improved digital promotion.	68% prefer destinations with strong digital presence; 72% check reviews before visiting; 56% rely on social media as the main source.	Strong digital visibility becomes a core value proposition, supported by the demand for accurate, accessible, and engaging online information.
Experience Quality & Safety	Visitors expect safe photo spots, maintained trails, and educational experiences about nature.	48% come for scenery/photography; 27% for relaxation; high agreement on safety and facility importance.	Safety, comfort, and experiential education form a value bundle that meets both expectations and motivations.
Community Engagement & Authenticity	Local community wants fair involvement and training; tourists desire authentic, socially rooted experiences.	60% follow tourism content highlighting local culture; visitors value authentic and community-driven experiences.	Authentic eco-cultural experiences become a unique value proposition supported by co-created offerings with the community.
Service & Facility Improvement	Users complain about cleanliness, toilet facilities, signage, and parking.	High satisfaction scores relate strongly to facility quality; facility indicators correlate with revisit intention.	Improving basic facilities enhances perceived value and strengthens the promise of a comfortable and reliable ecotourism experience.
Business Model Needs	Managers need a clear business model, SOPs, role clarity, and digital marketing structure.	Survey supports the importance of structured services and transparency (e.g., digital ticketing).	A sustainable BMC grounded in user expectations and operational needs enhances overall destination reliability and competitiveness.

Source: Processed data, 2025

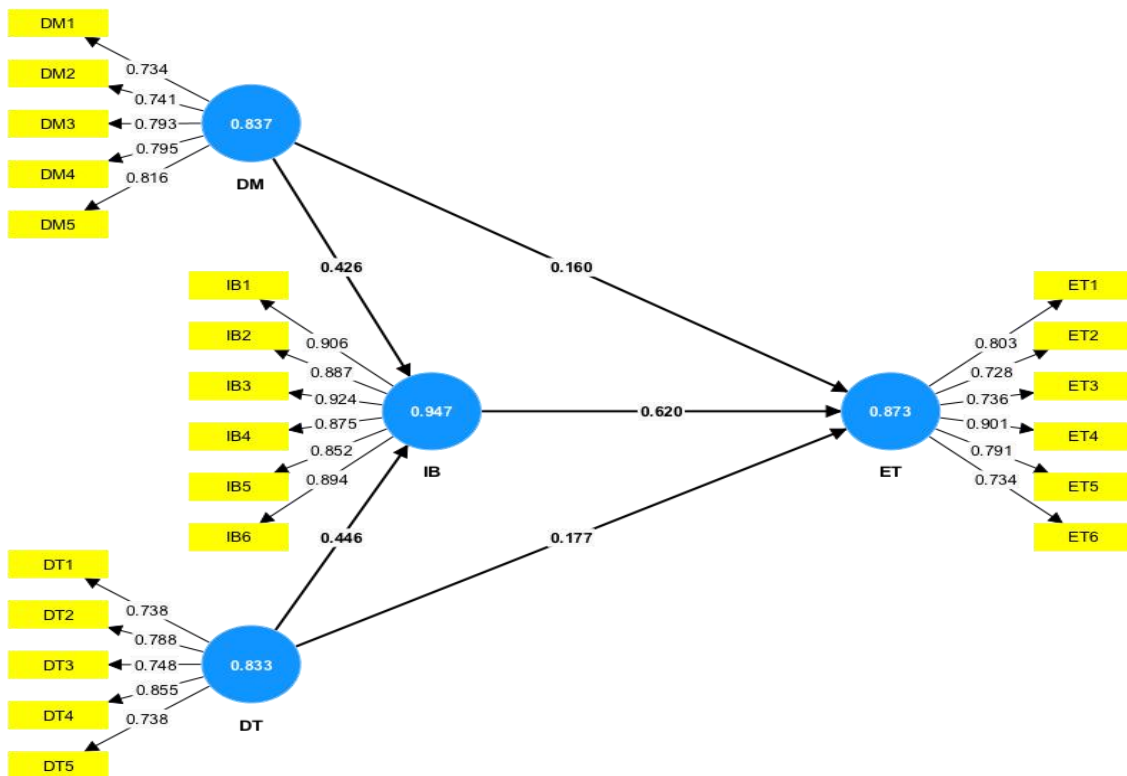


Figure 1. Measurement Model
Source: Processed data, 2025

<p>Key partners:</p> <ul style="list-style-type: none"> Local community groups and village stakeholders Tourism Office of Kabupaten Tangerang Schools and educational institutions Local SMEs (food stalls, handicrafts) Digital partners: influencers, photographers, travel bloggers Environmental NGOs or youth eco-communities 	<p>Key activities:</p> <ul style="list-style-type: none"> Destination maintenance and environmental conservation Developing and updating digital content (photo, video, information) Managing ticketing and visitor services Guiding tours and conducting eco-education programs Community training (hospitality, storytelling, safety) Monitoring visitor experience and feedback 	<p>Value Proposition:</p> <ul style="list-style-type: none"> Authentic eco-tourism experience with natural rock formations and scenic landscapes Safe and well-maintained photo spots and walking trails Educational eco-tour packages focusing on environment, culture, and local narratives Digital information clarity (accurate routes, ticketing, schedules, facilities) Community-based experience, promoting local products and guided tours Affordable destination compared to urban attractions Environmentally responsible tourism supporting conservation and local livelihoods 	<p>Customer relationships:</p> <ul style="list-style-type: none"> Friendly and informative on-site staff interaction Digital engagement via social media updates and interactive content E-ticketing system for convenience and transparency Visitor feedback system (QR-based survey) Community-guided tours enhancing personalized experiences 	<p>Customer segments:</p> <ul style="list-style-type: none"> Domestic young travelers (17-35 years) seeking nature & photography experiences Family groups looking for affordable outdoor recreation Eco-tourism enthusiasts interested in nature education Social media-active visitors (Instagram/TikTok users) School groups or communities needing environmental learning trips Local and regional tourists seeking weekend leisure destinations
<p>Cost structure:</p> <ul style="list-style-type: none"> Maintenance and environmental management Staff salaries and training Digital marketing and content production Facility improvement (signage, toilets, safety barriers, rest areas) Technology costs (website, e-ticketing system) Community development programs Administrative and operational expenses 		<p>Revenue streams:</p> <ul style="list-style-type: none"> Entrance ticket sales Guided tour packages Parking fees Local product sales (UMKM stands) Food & beverage collaboration fees Photography packages or special access fees Sponsorships or digital collaborations 		

Figure 2. Business Model Canvas
Source: Processed data, 2025