

Digital Tourism and the Recovery of International Tourist Arrivals to Indonesia Post-COVID-19

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ABSTRACT

The COVID-19 pandemic caused an unprecedented collapse in international tourism, severely impacting Indonesia's visitor-dependent economy. In response, tourism stakeholders accelerated the adoption of digital solutions to mitigate losses and stimulate recovery. This study investigates how digital tourism has influenced the rebound in international tourist arrivals to Indonesia between 2020 and 2024. Employing a systematic literature review, the analysis identifies four key themes: digital marketing and destination branding, virtual tourism platforms, mobile-based and contactless services, and policy-driven digital readiness. Findings show that digital innovations played a crucial role in restoring destination visibility, traveler trust, and operational adaptability. However, their impact was uneven due to infrastructural disparities, digital literacy gaps, and inconsistent policy execution. The study concludes that while digital tourism fosters resilience and competitiveness, its long-term success requires inclusive infrastructure, inter-institutional coordination, and strategic national integration.

ABSTRAK

Pandemi COVID-19 menyebabkan keruntuhan besar dalam sektor pariwisata internasional, yang secara drastis memengaruhi perekonomian Indonesia yang bergantung pada kunjungan wisatawan. Sebagai respons, para pemangku kepentingan mempercepat adopsi solusi digital untuk mengurangi dampak dan mendorong pemulihan. Penelitian ini mengkaji bagaimana pariwisata digital memengaruhi lonjakan kembali kunjungan wisatawan mancanegara ke Indonesia pada periode 2020–2024. Dengan menggunakan metode tinjauan pustaka sistematis, kajian ini mengidentifikasi empat tema utama: pemasaran digital dan pencitraan destinasi, platform wisata virtual, layanan *mobile* dan tanpa kontak, serta kesiapan digital berbasis kebijakan. Hasil menunjukkan bahwa inovasi digital berperan penting dalam memulihkan visibilitas destinasi, kepercayaan wisatawan, dan adaptabilitas operasional. Namun, dampaknya tidak merata akibat kesenjangan infrastruktur, rendahnya literasi digital, dan pelaksanaan kebijakan yang belum seragam. Studi ini menyimpulkan bahwa pariwisata digital dapat mendorong ketahanan dan daya saing, tetapi keberhasilannya bergantung pada infrastruktur yang inklusif, koordinasi antar lembaga, dan integrasi strategis dalam perencanaan nasional.

1. Introduction

The global tourism industry experienced an unprecedented disruption due to the COVID-19 pandemic, leading to strict travel restrictions, border closures, and a collapse in international mobility. Indonesia, as a prominent tourist destination in Southeast Asia, was significantly impacted, with international arrivals plummeting from 16.11 million in 2019 to just 4.02 million in 2020 [1], [2]. This abrupt decline not only affected macroeconomic indicators but also disrupted local economies, particularly in tourism-dependent regions such as Bali, Yogyakarta, and Lombok [3], [4].

As governments and industries sought recovery pathways, digital transformation emerged as a strategic

response to adapt to shifting traveler behavior and health protocols. The rise of digital tourism—defined as the integration of digital technologies into the tourism value chain—enabled destinations to maintain visibility, communicate health safety, and offer contactless services [5], [6]. Virtual tours, digital marketing campaigns, and mobile-based travel services became essential in re-engaging potential tourists during and after the pandemic lockdowns.

In Indonesia, the Ministry of Tourism and Creative Economy introduced several digital initiatives under programs like “Wonderful Indonesia” and “Kharisma Event Nusantara” to revitalize tourism through technology [7], [8]. These efforts included collaborations with technology companies to enhance online visibility of destinations, train local tourism

operators in digital literacy, and develop smart tourism infrastructure in key regions. As a result, digital channels such as Instagram, YouTube, and TikTok became central to destination branding and tourist engagement [9], [10].

Emerging studies suggest that tourists increasingly rely on digital content, peer reviews, and virtual experiences when making travel decisions, especially in post-pandemic contexts where safety and convenience are top priorities [11], [12]. This shift in consumer behavior underscores the need for an in-depth understanding of how digital tourism has influenced actual visitation patterns to Indonesia post-COVID-19. It also raises questions about the effectiveness, reach, and inclusivity of such digital initiatives, particularly in a geographically diverse country like Indonesia.

This article aims to explore the role of digital tourism in the recovery of international tourist arrivals to Indonesia after the COVID-19 pandemic. It analyzes recent academic and policy literature to identify trends, challenges, and impacts of digital strategies on tourist behavior and industry performance. By synthesizing existing evidence, the review contributes to a more comprehensive understanding of digital tourism's potential as a resilient and sustainable path for post-crisis recovery.

2. Research Method

This study applied a systematic literature review to analyze how digital tourism has shaped the recovery of international tourist arrivals to Indonesia after the COVID-19 pandemic. The review focused on scholarly publications and policy documents from 2020 to 2024, emphasizing empirical and conceptual insights related to digital innovation in tourism services, marketing, and infrastructure. Relevant literature was identified through targeted searches across Scopus, Web of Science, ScienceDirect, and Google Scholar using keywords such as “digital tourism,” “Indonesia,” “post-COVID,” and “tourist arrivals.” Supplementary grey literature was sourced from the Badan Pusat Statistik (BPS) and Indonesia’s Ministry of Tourism and Creative Economy to contextualize findings with official data and policy directions.

Articles were selected if they addressed digital tools or strategies in Indonesian tourism and presented empirical or theoretical analysis of tourism performance post-pandemic. Studies lacking digital focus or specific relevance to Indonesia were excluded. From 162 initial sources, 34 peer-reviewed articles and 8 policy reports were retained after screening.

Thematic analysis was used to identify patterns across four core areas: digital marketing and branding, virtual tourism platforms, mobile-based and contactless services, and digital infrastructure challenges. These themes were cross-referenced with official BPS data on

tourist arrivals from 2019 to 2024 to establish correlations between digital initiatives and recovery trends. While limited by the availability of localized empirical studies and documentation from regional authorities, this method provides a structured synthesis of existing knowledge and a foundation for future research on digital tourism and policy planning in post-crisis contexts.

3. Results and Discussion

According to official data from Badan Pusat Statistik (BPS), Indonesia recorded 16.11 million international tourist arrivals in 2019—prior to the pandemic. From Figure 1, this figure dropped dramatically to 4.02 million in 2020 (−75.03%), followed by a further decline to 1.56 million in 2021. However, with the easing of global travel restrictions and targeted digital recovery strategies, arrivals rebounded to 5.47 million in 2022, 11.68 million in 2023, and 13.90 million in 2024, approaching pre-pandemic levels [13]. This trajectory illustrates not only the pandemic's impact but also the potential role of digital interventions in supporting the sector’s rebound.

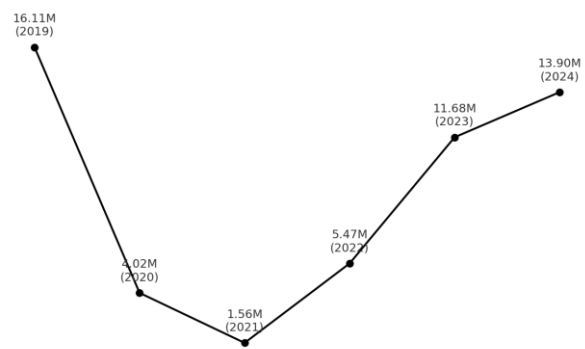


Figure 1. International Tourist Arrivals to Indonesia (2019–2024)

The recovery coincides with the implementation of nationwide digital strategies, such as mobile-based health applications, virtual tourism campaigns, and influencer-driven destination marketing. To understand how these digital initiatives influenced tourist behavior and destination performance, four major themes emerged from the literature: (1) digital marketing and destination branding, (2) virtual tourism platforms, (3) mobile-based and contactless travel services, and (4) digital disparities and policy readiness.

3.1. Digital Marketing and Destination Branding

The COVID-19 pandemic catalyzed an accelerated shift in how tourism destinations communicated with potential travelers. For Indonesia, digital marketing became an essential instrument in maintaining global visibility, stimulating domestic tourism, and rebuilding brand confidence during an extended period of travel uncertainty. The integration of storytelling, immersive visuals, and influencer-based outreach not only served to substitute the lack of physical mobility but also

reframed how destinations could be experienced and imagined remotely.

Social media platforms played a central role in this shift. With physical presence restricted, platforms like Instagram, TikTok, and YouTube emerged as critical avenues for delivering curated digital experiences that blended aesthetic appeal with cultural narratives [10], [14]. These platforms allowed the Ministry of Tourism and Creative Economy (Kemenparekraf) and local tourism actors to repackage destinations through emotional storytelling, engaging hashtags, and destination challenges that fostered user participation. The #DiIndonesiaAja campaign, for instance, was strategically designed to encourage domestic exploration while promoting user-generated content, amplifying reach through social proof and digital community building [15].

Digital marketing also helped reduce information asymmetry during the pandemic. As travel policies and safety requirements rapidly evolved, digital channels served as reliable sources of real-time updates on entry regulations, testing protocols, and health-certified accommodations. The availability of this information through search-optimized content and official tourism websites played a role in restoring trust and reducing perceived risk, especially for international travelers [16]. These efforts positioned Indonesia as a responsive and adaptive destination, capable of addressing tourists' post-pandemic anxieties.

Influencer marketing was another notable dimension of digital branding. Collaborations with lifestyle and travel influencers expanded the visibility of lesser-known destinations such as Banyuwangi, Belitung, and Samosir. These influencers, often with regional authenticity, helped personalize the tourism narrative and decentralize promotional focus away from heavily saturated destinations like Bali [9]. The shift toward micro-influencers with high engagement rates was aligned with a broader industry trend emphasizing niche content and community-based storytelling.

From a strategic communication perspective, many of these campaigns were informed by destination branding theory, which emphasizes brand image, positioning, and affective association as key predictors of travel intention [17], [18]. In the Indonesian case, destinations that successfully built an emotive digital presence were more likely to convert engagement into post-pandemic visitation. For example, data from post-lockdown periods in 2022 show increased bookings in destinations that had maintained consistent digital outreach, such as Yogyakarta and Lombok [8], [16].

However, the success of digital marketing initiatives was not uniformly distributed. Urban and infrastructure-rich areas benefited disproportionately due to superior connectivity, content production resources, and access to digital talent. In contrast, rural

destinations and community-based tourism operators often lacked the technical skills or funding to create competitive digital content [19]. This disparity raises concerns about inclusivity in Indonesia's digital tourism recovery and highlights the importance of capacity-building programs and equitable digital infrastructure investments.

Moreover, while digital campaigns often achieved high levels of online engagement, the conversion rate to actual bookings varied based on message consistency, call-to-action clarity, and integration with booking platforms. Campaigns that were visually appealing but lacked seamless transitions to transactional services (e.g., booking engines, itinerary planners) underperformed in actual tourist conversion [10]. This finding emphasizes that digital marketing must be integrated into the broader digital tourism ecosystem, connecting content, platforms, and services within a coherent user journey.

In essence, digital marketing in Indonesia during the pandemic transcended its traditional role as a promotional tool. It became a resilience mechanism—sustaining destination presence, rebuilding traveler trust, and re-engaging fragmented markets. Its success post-COVID underscores a fundamental paradigm shift: destination branding is no longer confined to brochures or physical events but is shaped by algorithms, engagement metrics, and the narrative power of digital networks.

3.2. Virtual Tourism and Immersive Digital Experience

The integration of virtual experiences into Indonesia's tourism recovery strategy emerged as a response to mobility restrictions and the need to maintain emotional engagement with destinations. Virtual tourism encompasses digital simulations of real-world locations using technologies such as 360-degree video, virtual reality (VR), and augmented reality (AR). While such experiences cannot substitute physical travel, they have proven valuable in preserving destination relevance and stimulating post-crisis travel intention [20], [21].

Several Indonesian destinations implemented immersive experiences to engage domestic and international audiences. Notable among these were virtual temple tours in Bali and digital showcases of Borobudur, which allowed potential travelers to interact with cultural sites remotely through mobile apps and YouTube integrations [22], [23]. These efforts reflected a shift toward emotional pre-experience, where tourists engage with a destination's essence before making travel decisions. Such virtual content also served as promotional tools, particularly for younger demographics accustomed to digital interactivity.

Studies have shown that immersive tourism content enhances perceived authenticity and emotional

connection to destinations. For example, virtual heritage experiences have been found to increase cognitive and affective responses to Indonesian historical sites, leading to higher interest in physical visitation once travel restrictions eased [24]. Similarly, virtual environmental tours in Raja Ampat have been shown to foster greater ecological awareness and future visitation intent among international audiences [25].

The success of these experiences depends on both content design and technological accessibility. In Indonesia, the implementation of VR and AR has largely been limited to pilot programs, often supported by international partnerships or university-driven initiatives. The cost of development, equipment limitations, and internet connectivity disparities have inhibited widespread adoption among small tourism operators [26], [27]. Consequently, while immersive tourism offers transformative potential, its application remains uneven across regions.

Government support has also played a role in shaping the virtual tourism landscape. The Ministry of Tourism initiated “Virtual Indonesia,” a program showcasing various destinations through 360° visuals and interactive experiences, aimed at keeping Indonesia on global travel radars [28]. However, critics have noted the need for better integration of these virtual campaigns with real-world tourism supply chains, including accommodation booking platforms and tour packages, to ensure conversion from digital engagement to physical travel [29].

Despite these limitations, virtual tourism has redefined the notion of travel experience. It provides inclusive access for those with physical or financial limitations, supports cultural preservation through digital archiving, and offers an eco-friendly alternative in line with sustainable tourism objectives. As technological capabilities improve and costs decline, virtual tourism could serve as a complementary rather than substitute experience that enhances the pre- and post-travel lifecycle.

3.3. Mobile-Based and Contactless Travel Services

The demand for safety, convenience, and operational efficiency in travel increased significantly following the COVID-19 pandemic. In response, mobile-based and contactless travel technologies became central to Indonesia’s tourism recovery. These tools, ranging from e-ticketing and QR-based payments to real-time health tracking apps, were deployed not only to minimize physical contact but also to enhance traveler confidence and streamline service delivery [16], [30].

The Indonesian government’s rollout of PeduliLindungi, a mobile health surveillance application, exemplifies this shift. Initially designed for health tracing, the app evolved into a multipurpose platform used for entry into tourist attractions, hotels, and public transportation. Integration of vaccination

records, travel permits, and location-based alerts into one centralized application demonstrated the capacity for mobile innovation in ensuring compliance with dynamic health protocols [31], [32]. Studies indicate that destinations with strict but seamless mobile check-in systems were better able to retain visitor flows without compromising safety [33].

Private-sector platforms also adapted swiftly. Online travel agents (OTAs) like Traveloka and Tiket.com introduced features such as “CleanStay” filters, contactless check-in, and flexible rescheduling policies embedded directly into their mobile apps. These features were widely adopted by hotels and airlines, providing reassurance to users who demanded minimal human interaction in booking and boarding processes [34], [35]. Moreover, mobile-first strategies aligned with the growing reliance on smartphones among Indonesian consumers, particularly in urban and millennial segments. This behavioral alignment echoes patterns seen in the fintech sector, where mobile application adoption is strongly influenced by financial literacy, perceived ease of use, and consumer confidence in digital systems—factors equally relevant to mobile tourism services [36].

In addition to transactional functions, mobile-based services increasingly provided real-time tourism information. Destination management organizations (DMOs) and local governments introduced apps that included digital maps, event calendars, and crowd-monitoring features. For instance, the “Jogja Istimewa” app offered real-time crowd updates in popular Yogyakarta attractions, allowing tourists to avoid congestion and plan visits more effectively [37]. These services contributed to more informed and safer tourism behavior, supporting risk mitigation efforts in crowded areas.

However, the benefits of mobile-based services were not distributed evenly. Smaller tourism operators, particularly in rural regions, faced difficulties in adopting mobile tools due to lack of digital literacy, cost constraints, and inadequate infrastructure. These challenges created asymmetries in the implementation of contactless travel, with digitally mature destinations enjoying faster recovery and broader reach [38]. In some cases, tourists were discouraged from visiting destinations that lacked mobile integration, especially when health compliance depended on digital access.

The sustainability of contactless tourism is also being debated. While these technologies improve hygiene and convenience, they may inadvertently erode the human connection and cultural authenticity central to the tourism experience. Scholars argue that balance is needed—where automation enhances efficiency without replacing social interaction and cultural engagement, especially in community-based tourism contexts [39].

In summary, mobile-based and contactless services significantly supported Indonesia's tourism reactivation by increasing traveler confidence, enhancing safety, and improving operational transparency. Yet, the uneven adoption of these technologies highlights the importance of inclusive digital capacity-building to avoid deepening disparities across the tourism sector.

3.4. Digital Disparities and Policy Readiness

While Indonesia's post-pandemic tourism recovery has been aided by widespread digital innovation, not all regions or actors have benefited equally from this transformation. Significant digital disparities—driven by infrastructure gaps, economic constraints, and uneven digital literacy—have emerged as barriers to equitable participation in the digital tourism ecosystem. These disparities reflect broader structural inequalities across Indonesia's archipelagic geography, where rural destinations and small-scale tourism operators remain marginalized in the digital economy [19], [38].

Many remote regions lack access to stable internet, reliable electricity, and mobile networks, severely limiting their capacity to adopt digital tools for tourism promotion or service delivery. In such areas, community-based tourism initiatives struggle to maintain online visibility or integrate mobile-based solutions, such as QR code payments, booking engines, or social media marketing strategies [40]. These infrastructural deficiencies also hinder their eligibility for digital grants or participation in national campaigns that presuppose baseline technological readiness.

Even where infrastructure exists, digital literacy remains uneven. Research shows that many small and medium tourism enterprises (SMTEs) lack the technical skills to manage digital platforms or interpret online engagement data [29]. This limits their ability to compete in algorithm-driven environments such as Google Search or Instagram, where performance is shaped by content frequency, audience interaction, and search engine optimization. As a result, tourism recovery in these regions tends to lag behind better-connected urban destinations like Bali, Jakarta, and Bandung [41].

At the policy level, digital transformation efforts have often lacked coordination between national and regional governments. While the Ministry of Tourism has launched numerous digital tourism programs—such as the "Digital Nomad Visa" and "Smart Tourism Destinations" roadmap—their implementation at the local level is frequently delayed or diluted due to limited budgets, bureaucratic fragmentation, and unclear regulatory frameworks [8], [42]. These disconnects have weakened policy effectiveness, particularly in provinces where tourism governance is decentralized but under-resourced.

Furthermore, the absence of national standards for digital tourism platforms and data interoperability hinders integration across systems. For instance, visitor data collected through different mobile apps—be it for health tracing, reservations, or destination analytics—are rarely aggregated or shared across ministries, preventing holistic planning and performance evaluation [43]. This fragmentation not only reduces the efficiency of digital investments but also diminishes the state's ability to monitor real-time recovery trends and respond proactively.

Efforts to address these gaps are emerging, albeit gradually. Public-private partnerships have begun offering digital training workshops for local tourism actors, and several regional governments have initiated broadband expansion projects to support rural tourism villages. However, scholars warn that without a clear digital inclusion strategy embedded in national tourism policy, these fragmented efforts will fail to close the digital divide or foster long-term competitiveness [44], [45].

In conclusion, while digital transformation has reshaped the trajectory of Indonesia's tourism recovery, it has also exposed and, in some cases, exacerbated structural disparities. Achieving an inclusive digital tourism future requires more than technological solutions—it demands coordinated policymaking, equitable infrastructure development, and sustained digital capacity-building across all levels of the tourism ecosystem.

3.5. Discussion

The preceding themes reveal that Indonesia's digital tourism transformation played a pivotal role in mitigating the economic and reputational impact of COVID-19 on the travel sector. However, their combined analysis reveals both opportunities and structural limitations in the post-pandemic tourism recovery. A comparative reading across the four domains—digital marketing, virtual tourism, mobile-based services, and policy-driven digital readiness—illustrates that while digitalization enhanced visibility, access, and traveler confidence, it also risked reinforcing existing regional and socio-technical inequalities.

The most immediately impactful initiative appears to be digital marketing and branding (3.1), which enabled destinations to retain global presence and maintain emotional engagement during a period of mobility collapse. These efforts were amplified by social media platforms and influencer content that offered dynamic, relatable narratives. Yet, the reach and quality of this content were highly dependent on the availability of skilled personnel, internet infrastructure, and digital production resources—advantages that predominantly benefited urban, well-funded destinations [15], [16].

In contrast, virtual tourism (3.2) offered a more experimental, long-term potential by reshaping how destinations could be experienced and marketed beyond physical travel. While this approach enhanced sustainability and cultural preservation goals, it lacked widespread implementation due to technological costs and uneven digital literacy, particularly among smaller operators. This mismatch underscores the challenge of mainstreaming innovation without first addressing foundational readiness [23], [26].

Mobile-based and contactless travel services (3.3) had arguably the most practical value for travelers during the pandemic, providing tools to ensure hygiene, safety, and transactional ease. Government platforms like *PeduliLindungi*, and enhancements by OTAs, aligned well with shifting consumer expectations. Nevertheless, their uneven adoption among rural or informal sector stakeholders suggests a digital divide not only in access, but in adaptability and compliance capabilities [32], [35].

The final theme—digital disparities and policy readiness (3.4)—acts as a critical counterbalance to the optimism of the previous sections. While national strategies such as “Smart Tourism Destinations” provide a framework, the execution is often hindered by decentralized governance, policy fragmentation, and inconsistent digital training. Regions with strong local government support and private sector collaboration performed markedly better in deploying digital solutions, while others fell behind due to structural disadvantages [8], [19].

Together, these findings suggest that digital transformation in Indonesia’s tourism sector is not a singular trajectory, but a stratified process shaped by geography, governance, and socioeconomic capacity. Rather than uniformly empowering all stakeholders, current digital strategies risk reproducing uneven recovery outcomes unless coupled with structural investments in infrastructure and human capital development. This echoes the literature on digital inequality in global tourism, which warns that benefits from innovation are often distributed along existing lines of power and resource access [6], [20].

Strategically, the Indonesian tourism recovery model offers useful insights for other emerging economies. It demonstrates how rapid digital adaptation—through marketing, mobile tools, and virtual experiences—can partially substitute for physical access and stimulate demand. However, it also highlights the limits of technology as a stand-alone solution. Without institutional coordination, inclusive policies, and digital ecosystem integration, the impact of such innovations will remain fragmented and possibly exclusionary.

Hence, any long-term digital tourism strategy must be embedded in broader national development planning, ensuring not only competitiveness but also resilience

and equity. As Indonesia prepares for global events such as World Tourism Day and potential international expos, prioritizing inclusive digital transformation will be essential in framing tourism not just as an economic sector, but as a vector for equitable, sustainable development.

4. Conclusion

Indonesia’s post-COVID-19 tourism recovery has been heavily influenced by digital transformation across areas such as marketing, service delivery, and destination engagement, utilizing tools like social media campaigns, virtual tours, and mobile-based health and booking platforms to rebuild traveler confidence and sustain international visibility. Despite these advances, the benefits remain unevenly distributed due to infrastructural constraints, digital literacy gaps, and fragmented policy implementation, particularly in rural and underserved areas. Thus, the success of digitalization depends on inclusive access, strong institutional coordination, and its long-term integration into national tourism planning. To promote equitable growth, it is essential to enhance digital infrastructure in rural destinations, expand capacity-building programs for small and medium tourism enterprises, and embed digital strategies within national tourism frameworks. Additionally, efforts should focus on developing interoperable digital ecosystems, supporting locally driven innovation that reflects regional identity and sustainability, monitoring digital equity through measurable indicators, and fostering responsible digital engagement that preserves cultural authenticity and amplifies community narratives.

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