

Technology & Digitization for Sustainable Tourism Growth: A Review of Indonesia & New Zealand

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ABSTRACT: -

Integrating information and communication technologies (ICT) significantly enhances sustainable tourism practices' efficiency by optimising operations, improving visitor experiences, and promoting eco-friendly initiatives. This technological transformation, often called "e-tourism," facilitates better resource management and supports aligning tourism activities with sustainability goals. Technology is essential to the advancement of environmentally friendly tourism activities. More sustainable operations result from effective resource management, waste reduction, and carbon footprint monitoring, which are made possible by these technologies. Technology also impacts sustainable tourism by increasing operational effectiveness, cutting expenses, and drawing eco-aware tourists. It makes better tourist management possible by guaranteeing a satisfying experience while reducing the adverse effects on nearby populations and ecosystems. This study investigates how technology balances sustainability, economic growth, and enhanced visitor experiences in the post-pandemic tourism landscape. It compares and contrasts New Zealand's regenerative tourism model with Indonesia's conservation-focused approach, highlighting the impact of technology on these models.

The study employs a comparative case study approach, examining the post-pandemic tourism strategies of New Zealand and Indonesia. It analyses government initiatives, private sector innovations, and community-based programs related to technology integration in tourism management. Specific examples include the Borobudur Temple in Indonesia and various initiatives in New Zealand.

The study reveals that technology plays a crucial role in enhancing tourism sustainability. New Zealand utilises technology to support its regenerative tourism model, focusing on environmental restoration and cultural preservation. Indonesia leverages technology for conservation efforts, including visitor management and protection of cultural sites. Both countries demonstrate the potential of technology to improve accessibility and operational efficiency.

Keywords: Technology, Sustainable Tourism, E-Tourism, Tourism Development

INTRODUCTION:

The tourism sector is one of the most dynamic and fastest-evolving global marketplaces. It is also one of the industry's most susceptible to macro-economic changes, environmental challenges and geo-global politics. UNWTO projects that by 2030, sustainable travel is expected to be a key focus, as many regions aim to balance tourism growth with environmental and social goals. Technology is a key force behind this paradigm shift, providing opportunities to improve guest experiences, encourage ethical tourism, and protect travel destinations' environmental and cultural integrity (Das, Bosco, Ekka, Aarif, & Alamai, 2023). The sector's future will be shaped by laws that promote eco-friendly travel and fair tourist growth, with large expenditures in green infrastructure and technology facilitating these developments.

Technology becomes a force for change in the face of these obstacles, providing a range of answers to sustainability issues (Youssef El Archi 1, 2023). New developments in artificial intelligence, virtual reality, and the Internet of Things also provide fascinating prospects for immersive cultural encounters that promote intercultural understanding and tailored eco-friendly travel suggestions. These developments can improve visitor engagement and completely transform the travel industry. (Talukder, 2024).

The COVID-19 pandemic has undoubtedly been a significant challenge for the industry, but it has managed to bounce back at a respectable speed. The global health crisis has accelerated innovation within the travel industry. The digitalisation of this industry has contributed to its growth, and the technology is here to stay. AI, in particular, has been ushering its way into the tourism industry, showing the need for adaptability and the potential for further technological advancements. This paper will explore the pertinence and credibility of technological advancements within the tourism sectors of New Zealand and Indonesia, focusing on how emerging innovations have transformed the travel experience and optimised operational processes in these regions. It provides overviews of the technologies adopted, their impact on the tourism industry, the changes made to the tourist experience, the juxtaposition of the two, and an analysis of the Borobudur temple and New Zealand's innovative approach to tackling various challenges.

Finally, the paper will conclude with the insights on the feasibility of the future of technology in the tourism sector.

Technologies in tourism

Technology has been involved in tourism management since the mid-20th century, and its influence has grown over time due to advancements in communication and automation. Specifically, in the 2010s, chatbots reshaped the industry with the introduction of intelligent tourism. This concept refers to using advanced technologies to enhance the tourist experience and streamline operational processes. *Technologies like Augmented reality (AR), Virtual reality (VR), and Robots have significantly accelerated the growth of the tourism industry* (2024). VR tours provided by the airlines have allowed users to have an immersive experience of their locations remotely. IoT is a chain of interconnected devices with unique IDs that exchange data over an established network. These devices constantly exchange data to achieve various goals: data collection and aggregation, predictive maintenance, tracking activities, and automation (2024). It is a no-brainer that artificial intelligence has taken over many industries. Travellers can ask and get instant replies to any questions: Which place should they visit on holiday, or what is better to do in a particular destination? Emerging technologies are crucial for the travel industry to adapt to and address the evolving consumer demands of global travel (2024). This demonstrates that technology has beautifully integrated itself into the tourism industry. Sustainability drives many key technology trends shaping the peregrinate and tourism industry. The cruise sector is witnessing a significant shift towards sustainable fuels, such as renewable biofuels, and exploring hybrid ships

powered partially by batteries. Green hydrogen and green methanol fuels are also gaining traction as promising alternatives to reduce the cruise industry's carbon footprint, appealing to environmentally-conscious travellers. Artificial Intelligence (AI) is another transformative technology within the industry, widely applied in customer service through Chatbots that provide quick responses and continuously learn from user interactions. AI also enables businesses to analyse large data sets, offering insights into performance trends, managing inventories efficiently, and improving customer satisfaction.

Meanwhile, blockchain technology is emerging as a decentralised solution for ensuring transaction safety, transparency, and security. Its applications in the tourism sector range from enabling secure bookings and managing customer loyalty programs to providing cryptocurrency payment options. These technologies are advancing operational efficiency and meeting the growing demand for sustainable and innovative travel experiences.

Technology as protector of the tourism experience

The tourism experience could be more robust and vulnerable to events that might fracture this experience. Tourists wish to have safe and secure experiences, even the risk-taking so-called "adventure tourists". Technology is employed to create a protected environment that tourists can experience. The protection afforded may be from natural elements (storms and local diseases), or it may involve protection from man-created dangers. In addition, technology is employed to protect the actual tourism destination/attraction itself from possible damage or degradation due to the tourist's presence. (People, 1991) investigated One area in which technology is very active in this regard involves weapons and bomb detection on aircraft. X-rays, pulsed fast neutron analysis, thermal neutron analysis, and gamma-ray scanning are all used or are under study to improve aircraft security. The trekker/tramper or Third World traveller is concerned about health issues. Traditional treatment technologies have focused on bacteria and viruses in water supplies. The increasing presence of the intestinal parasite *Giardia*, even in once remote and pristine areas, means travellers need to carry filters for the removal of *Giardia* as well as treatment for viruses and bacteria. A modern application of relatively simple technology treats water for all these problems and eliminates the typical half-hour wait required in other treatment systems.

"Y Technology used to protect the tourism experience must be affordable, exotic or high-tech (Markoff, 1991). Technology has become indispensable in fortifying the tourism industry, addressing safety concerns, enhancing peregrinator experiences, and ascertaining destination sustainability. Advanced security measures like X-ray and gamma-ray scanning systems safeguard air peregrinate, fostering a sense of security among tourists. Meanwhile, portable dihydrogen monoxide purification technologies address health challenges for peregrinators in remote areas, offering aegis against waterborne diseases and parasites like *Giardia*. These innovations are valuable for adventure seekers and those peregrinating to developing regions. Moreover, technology plays a pivotal role in preserving tourism destinations. From virtual authenticity tours that truncate physical footfall in sensitive areas to environmental monitoring systems that track human impact, technology ascertains that magnetisations are relished and conserved. The affordability and scalability of these solutions, such as GPS-predicated safety trackers and solar-powered purification systems, make them accessible to a broad audience, enhancing the tourism experience across diverse markets. Ultimately, technology integration ascertains a robust and resilient tourism industry, balancing peregrinator safety with destination.

Sustainability. As the sector evolves, adopting affordable, high-tech innovations will remain essential in distributing secure, delectable, and sustainable experiences for ecumenical tourists.

IMPACT OF TECHNOLOGY

The tourism industry has become the backbone of the global economy, contributing significantly to income and economic growth in many countries worldwide. With technological advances continuing to develop, especially in terms of the Internet, mobile computing, and other digital technologies, the paradigm of tourism management is also experiencing significant changes. Technology integration has become a key driver in transforming the tourism industry, influencing how visitors promote, manage, and enjoy tourism destinations. Technologies like AI and big data allow hyper-personalised per-personalised travel recommendations and itineraries to cater to individual preferences and improve customer satisfaction. Platforms like Trip Advisor and Expedia leverage AI to suggest accommodations and activities based on user behaviour. Virtual and augmented reality provides immersive previews of destinations, reducing uncertainty and enhancing decision-making. VR tours by airlines and travel agencies help travellers "experience" locations remotely. Technologies such as language translation apps and GPS-based navigation tools make destinations more accessible to diverse demographics.

The above discusses the positive impacts of technology. Every coin has two sides, keeping in mind that there is also a downside to the technology in the tourism sector. Most discuss technology as a tool of the tourism industry. This view tends to ignore the tourist and the tourism experience by focusing on the industry and its perceived needs or problems. There is also a focus on computer or information technology, almost to the exclusion of other forms of technology. Technology's role as destroyer of the tourism experience comes in several forms. To the extent that the tourism system relies on technology to create, protect or enhance the tourism experience, there is the potential that a technology breakdown will have the opposite effect. A "simulated" technology breakdown is used effectively to create a tourism attraction in theme park rides, such as Kong at Universal Studios and various simulator experiences at Disney (1933). The use of technology to create the tourist experience runs the risk of too great a fascination on the creator's part with the possible achievements of technology and a need for more attention to its "appropriateness" and cost.

One example of this may be the mega-resorts developed in Hawaii by Chris Hemmeter. With features such as dolphin lagoons, monorails, and canal boats, as well as development costs of \$360 million, using the term "Disneyland" to describe one of his resorts is both a compliment and a criticism" (Gibbs, 1989). The ultimate destruction of the tourism experience occurs when the experience ceases to exist. Discussions of the impact of global warming on world sea levels, clearly a technologically derived issue, indicate that significant tourism destinations such as Venice and low-lying Pacific islands may be severely impacted and even destroyed by rising waters. The warming may also cause certain ski areas to warm to the level at which they are no longer profitable. These are among the most vivid ways technology destroys the tourism experience. Opportunities exist to define better and analyse technology's historical, present, and future contributions to tourism. The result can be tourism and technology, which can result in an improved understanding of issues associated with introducing technology within the industry and of technical change from outside tourism impacting the industry. Instances where technology is the focal point of the tourism experience are more widespread than acknowledged in the existing literature or tourism "taxonomy". Investigation of such aspects may benefit the tourism industry and those interested in the contributions made by such locations to general scientific and technical literacy. The results could prove exciting and beneficial to researchers, students, the industry, and society (Stipanuk, 1993).

POST COVID 19 FUTURE: CASE STUDY OF BOROBUDUR TEMPLE, INDONESIA

What does the future of tourism management look like after COVID-19? Are we striving for business as usual, or will it be business? The COVID-19 pandemic has immensely impacted the

global leisure, tourism and hospitality sector (van Leeuwen et al., 2020). Especially in destinations dependent on international travel, the impact has been severe, as borders have been closed for a long time, and the recovery of international tourism arrivals is still not back on the levels pre-COVID-19. Despite the crisis impacting the sector, some considered the pandemic a wake-up call and an opportunity to rethink tourism. As Winston Churchill was working to form the United Nations after the Second World War, he famously said, "Never let a good crisis go to waste". In another context, tourism recovery after COVID-19 reflects the use of a crisis as an opportunity to bounce forward and build tourism destinations better and not bounce back to the initial situation running into the same potential problems. Taking observations from this iconic site, (healing et al., 2023) bridge this gap by showing practical observations of bold changes made at the Borobudur Temple close to Yogyakarta, Indonesia. This iconic temple in Indonesia is one of the world's most significant and impressive Buddhist temples and one of the most well-known UNESCO World Heritage sites.

Moreover, it is an enormous tourism magnet that attracts many visitors yearly (Damanik & Yusuf, 2022). Borobudur Temple is a renowned UNESCO World Heritage site in Indonesia and attracts many tourists. However, its fame has led to overcrowding, which has caused physical damage to the site and created issues like littering and irresponsible behaviour among visitors.

Problems such as tourists climbing on the temple, discarding chewing gum, and the prevalence of cigarette waste have worsened over time. The COVID-19 pandemic and the subsequent drop in visitor numbers allowed one to reassess tourism strategies and concentrate on sustainable practices. To address the challenges of over-tourism, capacity regulations were implemented, significantly lowering the daily visitor count from pre-pandemic figures of 8,000–10,000 to an initial limit of 1,200. Only 200 visitors are permitted daily, with plans to reach the capped number eventually. These policies correspond with international efforts in cities like Amsterdam, where carrying capacity frameworks effectively alleviate tourism pressures (Hartman & Heslinga, 2023). Reducing visitor numbers relieves stress on the structure and improves the overall experience by decreasing overcrowding. Officials have diversified visitor experiences by developing attractions beyond the temple grounds.

Buffer zones featuring luxury camping options and Village Economic Centers (Balkondes) motivate tourists to discover the surrounding region. These initiatives, guided by the UNWTO's recommendations for decentralising tourism hotspots, encourage community involvement and resource management. This strategy extends the duration of visitors' stay and creates economic opportunities for residents. Enforced guided tours now promote tourists' understanding of culture while regulating their behaviour. Certified local guides help ensure that visitors honour the temple's significance, tackling previous issues related to misconduct and the exclusion of locals from tourism profits.

Informative signs also support these initiatives by educating guests about conservation and cultural preservation. Economic reforms have played a significant role as well. Ticket prices were increased to USD 100 for international visitors and USD 50 for locals to support conservation efforts. However, this decision faced backlash regarding socioeconomic exclusion, with many claiming that the new rates would limit local access. In response, officials are developing a more equitable fee structure to balance inclusivity and conservation requirements. A distinctive conservation measure involves the introduction of eco-friendly Upanat footwear made from pandan leaves by local artisans. Visitors must wear these specially designed slippers to minimise physical damage caused by conventional shoes, addressing the annual stone deterioration of 0.042 cm, as reported in studies (Suhartono & Brahmantara, 2020). This initiative links conservation efforts to community economic empowerment, promoting sustainable practices. Involving local

communities in tourism has been crucial in addressing the initial backlash against exclusion. Locals now serve as guides, artisans, and key players in tourism management, adhering to UNWTO's support for inclusive tourism. These comprehensive strategies effectively balance heritage preservation with economic growth, presenting a model for sustainable tourism worldwide. By focusing on conservation, inclusivity, and community involvement, Borobudur sets a standard for tackling over-tourism while safeguarding cultural heritage for future generations (Wilson, 2024).

REGENERATIVE TOURISM: A CASE STUDY OF AOTEAROA, NEW ZEALAND

Over the past few decenniums, the planet has experienced the damaging effects of unchecked tourism magnification (Benjamin et al., 2020; Gossling and Higham, 2021 €; Hussain et al., 2021). Both domestic and international peregrinate have relied on conveyance that has significantly contributed to climate change (Dessens et al., 2014; Scott et al., 2012; Zivoder et al., 2015). Although the coronavirus disease 2019 (COVID-19) led to a decline in tourism (Fuste-Forne & Michael, 2021), 400 million international tourist advances were recorded in 2020 (UNWTO, 2022). The instauration of tourism in the post-COVID era betokens a shift towards a regenerative tourism model that accentuates mindful peregrinate (Hussain, 2021), which can efficaciously transform our perspectives, orchestrating, and execution of tourism (Ateljevic, 2020; Cheer, 2020; Sheldon, 2020). The effects of COVID-19 present a chance to reshape tourism (Higgins-Desbiolles, 2020). This incipient comprehensive approach fortifies adopting the regenerative tourism framework (Hussain & Haley, 2022), apperceiving the intricate nature of tourism systems. Within the context of regenerative tourism, this study argues that transforming the industry requires the involution of all stakeholders to promote enduring gregarious, cultural, environmental, and economic benefits, concretely fixating on the Incipient Zealand case. This will lead to future tourism experiences that prioritise the salubrity of local communities in tourism management and marketing, as "people" should guide the future of the visitor economy.

New Zealand's tourism sector, which previously relied heavily on international travellers, was profoundly affected by the COVID-19 pandemic, highlighting the vulnerabilities in its previous operating model. Before the pandemic, the sector depended on a high volume of foreign tourists, but the travel limitations brought to light the unsustainable nature of this strategy (Fountain, 2021; Hussain & Fuste-Forné, 2021). This situation led to a transition toward regenerative tourism, which advances beyond conventional sustainability by promoting resilience, environmental restoration, and community wellbeing (Reis, 2020; Sheldon, 2021). The regenerative approach emphasises long-term ecological health over immediate economic profit, focusing on preserving natural resources and enhancing cultural and social structures (Fountain, 2021). A vital aspect of this transformation is the integration of Māori principles, especially the involvement of iwi (tribes) in tourism. For instance, Ngāti Tūwharetoa considers itself the protector of Maunga Tongariro, a sacred mountain, guiding visitor conduct to honour its sanctity rather than modifying the landscape to suit tourists. This reflects a broader movement to make tourism more respectful of Indigenous traditions and local ecological systems (Parliamentary Commissioner for the Environment, 2019). The government has also aimed to involve a broad array of stakeholders, including iwi, local populations, and regional tourism entities, to collaboratively develop experiences that are both environmentally conscious and culturally rich (Glusac, 2020).

With borders closed in New Zealand since March 2020, the government seized the opportunity to shift toward domestic tourism, thereby underscoring the significance of regenerative tourism concepts. In response to the border restrictions, the New Zealand Tourism Taskforce advocated for a greater emphasis on social, cultural, environmental, and economic wellbeing within future tourism frameworks (RNZ, 2021). This transition has led to various regenerative initiatives, including the "Project Regenerative Tourism" initiated by the Sustainability and Resilience Institute (SRI), which established a model to incorporate social-ecological systems into tourism practices. This

model highlights the necessity for a self-organising system capable of adapting to global disruptions, utilising regenerative tourism metrics to evaluate progress in sustainability. Other programs, like New Zealand Awaits and The Seventh Generation Tours, have championed regenerative tourism by involving visitors in conversations on how tourism can benefit the Environment and local communities.

These tours emphasise Māori concepts like Turangawaewae (knowing one's place), kaitiakitanga (guardianship), and manaakitanga (hospitality), ensuring that tourism endeavours positively contribute to both visitor satisfaction and the wellbeing of the locations they explore. By concentrating on sharing oral traditions and cultural customs, these tours aim to regenerate not just the land but also the communities and individuals involved in tourism, ensuring that the advantages of tourism are distributed among all stakeholders (New Zealand Government, 2021). Tourism in Incipient Zealand has long been a vital part of the economy, and it has significantly contributed to the nation's prosperity and the livelihood of its people, categorically through its fixate on international visitors. However, the COVID-19 pandemic exposed the country's frangible dependency on international tourists, revealing how unsustainable the pre-pandemic tourism models were. The pandemic, which led to a sharp decline in international peregrinate, coerced Incipient Zealand to re-evaluate its tourism system and prompted a shift towards regenerative tourism.

Regenerative tourism, as outlined by Fountain (2021), accentuates a tourism model that transcends sustainability by fixating on environmental instauration, gregarious equity, and the salubrity of local communities. This approach is vital in balancing tourism magnification with environmental preservation and the cultural integrity of Indigenous communities, eminently the Māori. As Matunga et al. (2020) explicate, Māori have been involved in tourism for many years, but recent efforts focus more on reconnecting with cultural traditions, bulwarking natural resources, and providing employment for their communities. The Māori values of equity, sustainability, and salubrity are fundamental to developing tourism that venerates the land, culture, and people, composing the core of regenerative tourism. Māori cultural practices are a crucial element of this tourism model, stressing the importance of maintaining relationships between people and places.

These values are visually perceived in the ways Māori tribes, or iwi, engage with tourism, utilising their position as sentinels of the land to shape the comportment of tourists, ascertaining that their activities align with the salubrity of the Environment. Ngāti Tūwharetoa, for example, views itself as a sentinel rather than an owner of the sacred Maunga Tongariro, guiding visitors to treat the land with reverence rather than altering the landscape to accommodate tourism. Incipient Zealand's shift towards regenerative tourism has been apprised by these Indigenous perspectives, apperceiving that veridical sustainability can only be achieved when local communities and the natural Environment are at the centre of tourism orchestrating. As the Parliamentary Commissioner for the Environment (2019) notes, the inclusion of Māori voices and their values is essential in engendering tourism systems that are both ecologically and culturally sustainable. Incipient Zealand's path towards regenerative tourism was further highlighted by establishing the Incipient Zealand Tourism Taskforce in replication of the pandemic. The task force accentuated the paramountcy of developing a tourism model that fortifies gregarious, cultural, environmental, and economic salubrity, promoting a regenerative approach that benefits visitors and locals. According to the Incipient Zealand Regime (2021), regenerative tourism aims to balance the intrigues of the tourism industry, workers, and the Regime, fostering a sustainable visitor economy that values long-term health over short-term profits. The transition towards regenerative tourism also aligns with ecumenical shifts in how people view peregrinate, as peregrinators become increasingly vigilant of their peregrinations' environmental and cultural impacts. This shift is further encapsulated in the words of Renee Taylor, cited by Meyer (2020), who argues that the

post-pandemic world offers an opportunity to move away from the unsustainable practices of the past and engender an incipient tourism paradigm that embraces both humanity and nature.

The regenerative tourism model has gained momentum in Incipient Zealand, with sundry public and private sector initiatives to promote sustainable and enriching peregrinate experiences. The "Project Regenerative Tourism" by the Sustainability and Resilience Institute (SRI) of Incipient Zealand, for example, developed a model that integrates gregarious - ecological systems, engendering a tourism framework that acclimates to ecumenical shocks while promoting local resilience. This model emboldens a self-organising system that embraces scepticism and transmutes, highlighting the desideratum for tourism practices to evolve with shifting ecumenical trends. Incipient Zealand Awaits, another initiative, promotes the conversation around regenerative tourism by sharing stories through their podcast GOOD Awaits, discussing the positive impact of peregrinate experiences and how regenerative tourism can reshape the future of tourism. The Seventh Generation Tours, an enterprise built on regenerative tourism principles, further exemplifies how Māori values can drive this shift. This tour accentuates the Māori principles of Turangawaewae (kenning one's place), Kaitiakitanga (guardianship), and Manaakitanga (hospitality), ascertaining that both visitors and hosts contribute to the regeneration of the land and culture. The tours allow visitors to connect with Indigenous cognisance, fostering mutual reverence and ascertaining that tourism benefits both the people and the place. These tours preserve cultural heritage by sharing consequential oral stories while promoting a sustainable relationship between people and the land.

The regenerative tourism model in Incipient Zealand accentuates the importance of resilience and adaptability, drawing from Indigenous cognisance and practices. As Haley (2021) states, Indigenous ways of kenning and natural systems provide vital edifications for engendering resilient tourism models that prioritise vitality, health, and salubrity. When people build vigorous connections to a place, they are better able to make decisions that support the long-term sustainability of that place. This holistic understanding of tourism shows that the future of peregrinate depends on the competency to regenerate both the Environment and the cultural practices that sustain it. Regenerative tourism is not just about abbreviating negative impacts but about engendering a system that actively recuperates and enhances the places and communities involved. This approach challenges the traditional capitalist tourism models, prioritising profit over sustainability and calling for a paradigm shift that values the planet's and people's health.

In conclusion, regenerative tourism represents a critical shift in how the tourism industry operates, concretely in destinations like Incipient Zealand that are deeply connected to indigenous cultures and natural resources. This model, which accentuates sustainability, resilience, and cultural veneration, is essential for engendering a tourism system that benefits visitors and the host communities. By integrating indigenous values and fixating on long-term salubrity, regenerative tourism offers a path forward for a more sustainable and equitable future for the ecumenical tourism industry.

JUXTAPOSITION

Foundational Philosophy: Conservation vs. Regeneration

Indonesia's strategy for tourism in the aftermath of COVID-19 is primarily centred on sustainability and conservation, aiming to alleviate the negative impacts of over-tourism. For instance, the management of Borobudur Temple has limited the number of visitors to safeguard the structural integrity of this UNESCO World Heritage Site. The reduction of daily visitors from 8,000 to 1,200 highlights Indonesia's dedication to protecting its cultural and historical treasures. Initiatives such as guided tours and eco-friendly practices, including the requirement for visitors to wear pandan-leaf slippers, are designed to harmonise tourism with preservation. Conversely, New

Zealand adopts a regenerative tourism model beyond mere conservation. This approach not only seeks to maintain but also to enhance ecological, cultural, and social conditions. The Māori concepts of kaitiakitanga (guardianship) and manaakitanga (hospitality) form the foundation of the country's strategy, encouraging a profound respect for nature and the wellbeing of communities. Programs like the Seventh Generation Tours integrate these values to ensure that tourism benefits guests and locals, nurturing a balanced relationship between people and the Environment.

Indigenous Integration: A Central Role vs. Emerging Inclusion

New Zealand prioritises Indigenous culture and values in its tourism approach. The Māori, recognised as the traditional guardians of the land, are instrumental in shaping visitor experiences and policies. For instance, the Ngāti Tūwharetoa iwi manages the sacred Maunga Tongariro, guiding tourists in interacting with the site respectfully. This incorporation of indigenous knowledge preserves culture and educates tourists on the significance of environmental stewardship.

Despite its rich indigenous and local cultures, Indonesia has traditionally promoted a broader national identity in its tourism efforts. Nonetheless, the post-COVID era has initiated a shift.

Towards increased community engagement. Initiatives like Village Economic Centers (Balkondes) empower local populations to contribute to tourism by developing attractions and experiences beyond key sites like Borobudur. While Indigenous narratives still need to be more thoroughly integrated in New Zealand, steps towards involving locals in economic and cultural endeavours represent progress.

Visitor Management: Caps and Regulation vs. Education and Immersion

Indonesia implements strict visitor limits and regulations to mitigate tourism's impact. Capping the number of visitors at Borobudur Temple helps preserve the site while alleviating congestion. The requirement for guided tours and eco-friendly footwear highlights the significance of responsible tourism practices. These initiatives prioritise immediate and measurable conservation objectives. Conversely, New Zealand prioritises visitor education and immersive experiences to promote sustainability—initiatives like the Seventh-Generation program focus on storytelling, cultural heritage, and ecological awareness. By engaging tourists in discussions about sustainability and environmental concerns, New Zealand promotes lasting behavioural changes rather than relying merely on regulations.

Economic Strategy: Ticket Price Increases vs. Equitable Opportunities

Indonesia's economic strategy for sustainable tourism entails increasing ticket prices at popular sites like Borobudur Temple, where international visitors may pay up to \$100. This revenue aids conservation efforts but has raised worries about economically excluding local communities. Officials are striving to find a balance between access and preservation through fair pricing methods.

In contrast, New Zealand underscores broad economic inclusion via community-oriented tourism. Projects like regenerative tourism enable local stakeholders, including indigenous groups, to engage in and reap benefits from tourism. By generating job opportunities and promoting local entrepreneurship, New Zealand guarantees that tourism income is shared relatively, bolstering conservation and community advancement.

Environmental Emphasis: Immediate Actions vs. Sustained Resilience

Indonesia's environmental initiatives are focused on practical and immediate solutions to urgent issues such as physical damage to heritage sites. For instance, eco-friendly footwear helps prevent stone erosion at Borobudur while creating buffer zones that help guide tourism to less vulnerable areas. These efforts are designed to address current environmental challenges effectively.

New Zealand takes a long-term, systemic approach by integrating social-ecological systems into its tourism framework. Programs like Project Regenerative Tourism promote resilience by ensuring that tourism adapts to global challenges like climate change. By focusing on restoration and ecological health, New Zealand aims to leave the Environment in better condition than before, setting a precedent for future tourism models.

Is the future of technology and tourism feasible?

Indonesia and New Zealand have properly accumulated technology into their tourism industries to generate maximum input even after facing challenges. They adopted various new, cutting-edge technologies to capitalise on their situation. Whether using regenerative tourism or tackling over-tourism, they have successfully integrated technology for their benefit. The future of technology in tourism presents significant opportunities, providing advantages like improved customer experiences, greater operational efficiency, and enhanced sustainability. Developments such as virtual reality (VR), augmented reality (AR), and the Internet of Things (IoT) create more customised, customised, engaging experiences, allowing travellers to explore destinations virtually and enjoy innovative hotel accommodations with personalised services (WTO, 2023). Automation and digital technologies simplify tasks like check-ins, luggage handling, and payment processing, decreasing wait times and boosting convenience for travellers (WTO, 2023). In addition, technology aids sustainability by lowering resource use and reducing the necessity for physical resources, such as paper tickets and brochures (WTO, 2023). Improved connectivity through technologies like 5G enhances real-time access to services and information, particularly for international tourists (Guttentag, 2022).

The industry may need to revisit some fundamentals to build a far more sustainable future: either make the sector more attractive to talent (and put conditions in place to retain staff for more extended periods) or improve products, services, and processes so that they complement existing staffing needs or solve existing pain points. The industry may need to revisit some fundamentals to build a far more sustainable future: either make the industry more attractive to talent (and put conditions in place to retain staff for more extended periods) or improve products, services, and processes so that they complement existing staffing needs or solve existing pain points.

Nevertheless, these advancements pose challenges, including the potential for job loss as automated solutions may replace human positions within the hospitality industry (Guttentag, 2022). Excessive dependence on technology also reduces the personal aspect of tourism, as some travellers prefer human interactions over digital services (WTO, 2023). Furthermore, the heightened collection of personal data raises issues concerning privacy and cyber security (WTO, 2023), while the swift implementation of tech solutions could alienate specific groups, such as older travellers or individuals in remote areas, which may be uncomfortable with or Lack of access to advanced technologies (Guttentag, 2022). Therefore, although technology holds transformative potential, it necessitates careful examination of its social, economic, and ethical consequences to ensure an inclusive and balanced future for tourism. While applications, digital transformation, and technological advancements may provide a superior customer experience, tourism could face competition from these advancements, especially in virtual experiences. Museums, attractions, and historical landmarks can become interactive and, in certain instances, more realistic through AR/VR technologies that can enrich the travel experience by recreating historical locations or events. Until recently, tourism was one of the few industries that technology could not easily replace. The physical experience of visiting a new place was different. With the rise of the metaverse, that scenario may shift. Travellers might soon be able to participate in events or experiences from the comfort of their homes, sidestepping logistical challenges and avoiding the need to commit to travelling abroad for an extended period.

CONCLUSION:

The future of tourism lies in the strategic integration of technology to achieve long-term sustainability and enhance traveller experiences. Balancing innovation with ethical considerations, such as job displacement and cultural preservation, is essential. The case studies of New Zealand and Indonesia offer valuable insights into how technology can be effectively deployed to create more responsible and resilient tourism industries; both these countries have utilised the latest technologies to solve several quandaries. The pandemic has eminently impacted the tourism industry, affecting peregrinate and overall revenue.

In India, these technological advancements could prove vital in transforming the tourism sector into an ecumenical bellwether, enhancing visitor experiences while ascertaining sustainability and safety. By leveraging AI, data analytics, and virtual authenticity, India could address its tourism challenges and ascend its position in the international market.

The future of tourism is indubitably tied to technological innovation. As optically discerned in Indonesia and New Zealand, embracing technology offers a sustainable path forward, ascertaining that the industry thrives long after the pandemic. The transformative power of technology in tourism can help countries ecumenically recuperate and flourish in this incipient era. While incorporating technology within the tourism sector brings sundry advantages, it also introduces several challenges. The substantial expenses of adopting cutting-edge technologies may be too high for smaller enterprises or developing countries.

Furthermore, a dependency on digital solutions might result in quandaries such as job losses in traditional tourism roles, a diminished personal touch in accommodations, and increased cyber security susceptibilities. The swift embrace of technology could widen the digital divide, leaving some communities and areas needing to catch up, which could further impede fair magnification in tourism. These downsides must be addressed conscientiously to ascertain that technology amends rather than disrupts the industry. The future of tourism lies in embracing technology, where innovation not only reshapes the industry but also holds the puissance to unlock untapped potential and engender experiences beyond imagination. However, it is essential to tread punctiliously, ascertaining that progress benefits all, leaving no one behind.

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