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Review

How Artificial Intelligence (AI) Is Powering New Tourism Marketing and the Future Agenda for Smart Tourist Destinations

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Abstract: Artificial intelligence (AI) is a disruptive technology that is being used by smart tourist destinations (STDs) to develop new business models and marketing services to increase tourists' experiences and sales, revenue, productivity, and efficiency and STDs. However, the adoption of AI applications and platforms requires a high economic budget for STDs that want to integrate this digital tool into their future agenda and tourism development plans, especially when they set them up for marketing plans and operational processes. This iterative technology needs regular maintenance as well, leading to recurring costs and specialised crews in advanced technologies and marketing activities. This study aims to show the impact of AI advancements on STDs' tourism marketing to enhance the quality of services and illustrate their future agenda to improve tourists' experiences. A comprehensive literature review on AI technology and STDs has been conducted to illustrate new tourism marketing in their future agenda. Moreover, this study presents real examples of AI technology in a tourism context to better understand the potential of this digital tool. The findings of the current study support the idea that AI is a multipurpose tool that helps manage, monitor, and analyse sales information; revenue management; minimise prediction errors; streamline operations; and develop better marketing strategies, optimising economic resources, reducing marketing costs, and responding dynamically to changing needs for tourists and residents in STDs. Furthermore, the investment in AI technologies by STDs helps enhance the quality of products and services, and attract new investments, which benefit the regional economies and population's quality of life. This study is the first to address the use of AI to improve tourist marketing in STDs, which is its primary uniqueness. Also, this study identifies new opportunities and initiatives through AI that can be developed to help tourism marketing in STDs.

Keywords: artificial intelligent; smart tourist destinations; tourism marketing; tourist experiences

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1. Introduction

The implementation of new technologies and tourism marketing for smart tourist destinations (STDs) is key to attracting increasingly hyper-connected tourists. Artificial intelligence (AI) and metaverse technologies enhance accessibility, communication, and governance of STDs and the quality of life of residents [1]. Tourism and technology activities are inextricably linked to the future of STDs and tourists' experiences [2]. From a tourism marketing point of view, AI technology, such as ChatGPT and chatbots, has the capacity to design customised services and recommendations, and specific promotions in digital channels [3], as well as improve tourists' satisfaction and experiences at STDs [4]. For instance, machine learning (ML), deep learning (DL), and natural language processing (NLP) are analytical tools of AI for predicting and analysing the flow of tourists and their behaviours in tourism cities, thanks to algorithms and predetermined models, helping to create customer value [5]. Tourism marketing involves the promotion of a tourist destination to attract tourists and investment [6]. In the following years, tourism marketing

will gravitate towards AI and algorithms to generate value from data and customise promotion campaigns according to consumers' needs and preferences [7].

Tourism marketing is based on customers' feelings and appeals to the senses to create tangible wants and desires in consumers, particularly through digital channels. The tool ChatGPT is helping to create tourism marketing content to improve promotional material for destination marketing organisations (DMOs) and online travel agencies' (OTAs) websites and social media [8]. For example, tourism marketing strategies through the metaverse and AI technologies facilitate customised itineraries for tourists when they are travelling [9] and ever-improve tourist flows in STDs to reduce overtourism [10,11]. AI platforms, such as ChatGPT, Scribe, Wonderplan, Layla, Trip Planner AI, Vacay, and Iplan.ai, amongst many others, will change tourism marketing in the future, where communication with travellers will be different from what we know now [12,13].

Carvalho and Ivanov [14] note that OTAs and STDs' tourism marketing need to implement AI platforms to provide instant customer support and assistance, and promote the main tourist attractions [15]. Doğan and Niyet [16] argue that AI technology will mark the future agenda of tourism companies and STDs due to its ability to offer personalised recommendations and services in support of tourists' travel experiences [17,18]. Thanks to AI, travellers no longer need to visit travel agencies to book flights, hire vehicles online, or search for accommodation, and this offers consumers a more personalised booking experience. At its core, AI is a technology that relies on consumer data input. OTAs like Expedia, Skyscanner, and Booking have implemented chatbots in their operations to know specific details of consumers' trips and offer them the best deals and prices. STDs design tourism marketing strategies through AI technology to enhance tourism supply and create innovative products and services, enhancing residents' quality of life and tourists' experiences [19–21].

Therefore, the role of AI in tourism marketing for STDs cannot be overstated in their future agenda. STDs' tourism marketing through AI technologies also lifts the overall journey of tourists, marking a significant leap towards more interconnected and accessible smart tourism. The adoption of AI in the hospitality sector and STDs is at an incipient stage of development [22,23]. However, there is a scarcity of scientific studies covering the contribution of AI in STDs and its future scenario [24,25]. Given that AI is substantially transforming organisations, it is necessary to examine how AI will change the future agenda of STDs [26,27].

STDs are using AI technology to create new business models and marketing strategies that will improve visitor experiences and boost STDs' sales, profits, productivity, and efficiency. However, STDs that wish to use this digital technology in their future agendas and tourism development plans must have a substantial financial budget to embrace AI applications and platforms [28], particularly when they are set up for marketing strategies and operational procedures. Regular maintenance is also necessary for this iterative technology, which results in ongoing expenses and the requirement of specialist teams in cutting-edge technologies and marketing initiatives. In fact, AI platforms and applications give marketers a variety of tools to help optimise content generation processes; they have a bigger impact on marketing activities and results than earlier digital technologies [29,30]. For example, generative AI allows brands to give one-to-one tailored experiences in a way that is not feasible for marketing professionals and businesses, and it takes marketing and sales to a level never seen before [31]. Travel and tourism companies need to know the impact of AI technology in marketing plans and tourists' decision processes to improve tourism experiences [32].

Thus, the primary goal of this research is to demonstrate the influence of AI advancements on the marketing of STDs in tourism, with the aim of enhancing service quality and outlining future plans to enhance the overall tourist experience. This study is the first to address the use of AI to improve tourist marketing in STDs, which is its primary uniqueness. AI applications and platforms help segment and personalise consumers' wants and behaviours in STDs to deliver better services in terms of time and location [33]. Through AI,

tourism marketing and campaigns can improve the travel experience of tourists in STDs, as well as maximise companies' benefits [34]. A study carried out by Li and Zhang [35] created an AI smart tourism service platform, and their results showed that 96.65% of tourists recognised and loved this digital platform. AI technology will drive greater personalised product and service variety, increasing the global economic gain of companies by 45% in 2030; that is, AI could contribute up to $15.7 trillion to the global economy [36].

In order to achieve our goal and provide the finest conclusions on this topic, our study used the Web of Science and Google Scholar databases to locate the most recent research and consolidated researchers to examine AI technology in the tourism business. Researchers who study tourism and technology activities regard Web of Science and Google Scholar as two of the most significant databases [37,38]. In order to further demonstrate AI's potential for use in business operations and marketing plans, this paper includes current instances of its application in STDs and by travel and tourism businesses.

2. An Actual Overview of AI in STDs and Tourism Marketing

AI is a technological tool that helps create individualised offers that satisfy tourists' wants and needs, providing hyper-personalised information within specific and ubiquitous contexts [39]. Tourism demand is highly related to tourism marketing and AI-based models to encourage tourists to visit cities and their tourist attractions [40,41]. Tourism marketing is an activity that has the ability to contribute to commercial and social-economic growth in cities, as well as enhance tourists' experiences and communication with customers [42]. Inversini [43] notes that AI is notably improving the value creation of services and helping in the decision-making of consumers in STDs. The new challenges of STDs and tourism marketing will depend on AI technology and how they enhance tourists' experiences. Digital services, such as customisation, quality, speed, and convenience, will be a priority more than a necessity for tourists when they visit STDs. Tourism marketing and AI are paramount for operations and experience delivery in STDs because new generations use digital channels permanently to communicate with companies. AI is an iterative tool that improves the quality of communication between tourists and STDs, and provides tourism recommendations for both residents and visitors.

Inexorably, STDs are implementing AI technology to offer a better tourism supply and increase the levels of tourists' satisfaction experiences. An STD is a city that blends individualised tourism experiences based on the abundance of information and facilitated by digital technologies with an open area that ensures the city's sustainable growth and the needs of its citizens and tourists [1]. The aim of STDs is to create urban environments that provide their citizens with innovative services to improve their quality of life [44]. Disruptive technologies and innovation are key factors for STDs to survive uncertain times and crises, gain competitive advantages, and foster economic growth in today's world [19].

Indeed, anthropomorphism is a customer-based factor since it is derived from customer perceptions of technologies (AI, the metaverse, virtual reality, robots, chatbots, and augmented reality) and mobile devices in tourism cities and hotels [45]. STDs in China and Hong Kong have implemented AI technology in their processes, and they have seen reduced carbon emissions, improved customer services and satisfaction, and boosted cities' economic growth [46]. For example, the STDs of Málaga and Benidorm in Spain included generative AI in their marketing plans to adapt tourism supply to the diverse demands of different generations. We must be aware that the integration of ChatGPT was a great step in the qualitative and quantitative management of STDs' tourism marketing in terms of efficiency, ubiquity, and elevated customer satisfaction, providing 24/7 assistance and personalised recommendations. However, AI raises questions about the future role of human employees and their potential to redefine job roles in travel and tourism activities [47].

It is not all positive; the use of AI in the tourism industry provides new problems, such as the use of the private information of users and their data, biases, and hidden errors [48], and cyberattacks carried out by hackers in STDs and on travel and tourism companies that cause economic and personal damage [49,50]. Nevertheless, the potential of AI and

its algorithms resides in analysing vast quantities of data to provide personalised and segmented suggestions and products and services [51]. Consequently, ML is a part of AI where computer systems learn from the given data to offer better choices and recommendations for managers' companies and consumers that enhance people's quality of life in their daily lives. AI supported by ML in companies' marketing plans helps identify what content is most likely to bring customers back to the website or application and reduce marketing costs [52].

Hence, AI can create marketing content and materials at a lower cost for STDs and hotels to respond to customer trends more promptly [53]. For instance, chatbots powered by AI and AI platforms, such as ChatGPT, Trip Planner AI, Vacay, and Iplan.ai, have the potential to revolutionise the connection with customers and drive business growth. Dogru et al. [54] note that client pre-purchase processes and experiences through digital channels can be enhanced thanks to AI technology, as well as customer engagement and satisfaction. With AI algorithms, dynamic pricing is more effective for tailored offers for customers who are most likely to convert [55]. For instance, street traffic has notably increased in cities and finding a parking space has become increasingly difficult. AI applications can provide an optimal solution by predicting demand for parking zones in different areas of the city, and can adjust the availability of parking spaces and prices according to their demand and time slot.

Recently, marketers and STDs have been using AI techniques to manage and analyse sales information, minimise prediction errors, and develop better marketing strategies. According to the World Economic Forum (WEF), the STDs of Singapore, Amsterdam, Dallas, and Boston are excellent examples of how AI techniques enhance their economic, governance, and environmental sustainability [56]. STDs are very active in innovation, using AI applications to control and predict the consequences of planned services and marketing plans and strategies. For example, the STDs of San Diego in the US and Barcelona in Spain integrated AI technology in their operational processes to optimise their public services, reduce marketing costs, and improve the privacy and security of users on their websites.

In addition, large companies such as Google, Amazon, TripAdvisor, Apple, Trivago, and Expedia decided to implement AI to improve their products and services according to the needs of their customers. Alibaba, Airbnb, and Booking.com track customers' purchases and declined products, thanks to AI, to offer the best products and services option for their future purchases [57,58]. From a hotel marketing point of view, Hilton, Melia, Accor, Sofitel, Wyndham, and Leonardo hotels implemented AI technology to maximise the revenue potential of each guest and boost the scalability of their supply. Hoteliers who understand how to leverage AI tools will become more efficient, effective, and competitive than ever in terms of marketing and benefits. All this evidence shows us that tourism marketing powered by AI in STDs and travel and tourism companies will modify marketing, purchase, interaction, and cybersecurity activities for organisations and customers in the following years. Therefore, the application of AI in tourism marketing strategies can bring immense benefit to STDs and tourism companies.

3. AI as a Multipurpose Tool in STDs

AI is a powerful tool that enables STDs to optimise resource utilisation, reduce marketing costs, streamline operations, and respond dynamically to changing needs for tourists, residents, and companies. In this manuscript, an STD is a city that implements new technologies to offer the best touristic customised experiences in terms of ubiquity, social inclusion, quality, the environment, and sustainability for both residents and tourists [1,59]. Busan, Seoul, and Jeju as STDs implemented AI technology as a strategy to revitalise tourism demand, revenue management, and improve quality services for both tourists and residents [60]. AI also allows for the of monitoring key performance indicators (KPIs) in real-time (e.g., conversion rates, click-through rates, and engagement metrics) to optimise STDs' promotion campaigns dynamically, increase return on investment (ROI) from the previous year, and identify patterns and trends that require greater modification or attention.

For example, revenue management is focused on predicting customer behaviour through data analytics to enhance pricing and increase revenues [61]. Revenue management through AI technology is used by hotels, OTAs, and STDs to maximise revenues because this tool helps connect and manage online distribution channels to sell products and services in real time. In the hospitality industry, Smrutirekha and Karki [62] noted that AI based on revenue management is helping hotel managers to make better decisions in terms of dynamic pricing, maximising resource efficiency, revenue growth, and to control their related activities across digital channels and suppliers. Chatterjee et al. [63] revealed that AI adoption in partner relationship management is a good option to enhance business-to-business (B2B) sales channels. STDs jointly work with banks and Mastercard companies to facilitate electronic payments by consumers on the websites and applications of STDs. For instance, the scope of blockchain based on AI in STDs facilitates connections among all the agents in a secure, efficient, and transparent way [64,65].

From a business-to-consumer (B2C) point of view, AI technology facilitates the value co-creation of companies' products and services between consumers and chatbots or robots in terms of marketing and communication [66]. For instance, generative AI has boosted sales, marketing, customer journey, and productivity because this disruptive tool provides hyper-segmented and hyper-personalised services based on traveller customer behaviour or a specific company's needs, helping to reduce cost and time for B2B and B2C activities [67]. A study carried out by Rana et al. [68] found that in e-commerce, users are willing to use chatbots supported by AI to smooth the customer journey and engagement with the company. Araújo et al. [69] revealed that younger people are the most likely to interact with AI to look for a quick response to their requests through chatbots and AI platforms' recommendation systems.

Segmentation, sales prediction, and monitoring clients' purchases and behaviour through AI in marketing plans facilitate communication between consumers and companies, improving customers' co-creation in marketing processes [70]. Figure 1 illustrates AI as a multipurpose tool for STDs and how sales, the customer journey, human resources, marketing, revenue management, and operations areas are beneficiaries of this iterative technology and its algorithms. Additionally, the data displayed in Figure 1 were gathered from companies utilising AI in their operating procedures as well as the literature review. Information included in Figure 1 was selected from authors and private and public organisations of each study's references. The adoption of AI in human resource management is due to its ability to create value for companies, employees, and consumers, as well as increase companies' productivity [71]. Indeed, Kalia and Mishra [72] claim that automating repetitive tasks through AI optimises business operations and improves productivity in human resource departments. AI customer experience can increase customer satisfaction and enable teams to operate more efficiently and, in turn, boost their bottom line [73].

Haleem et al. [52] argue that AI in marketing is used to position companies' brands in digital channels, increase client demand and sales, keep track of purchases, and design and plan pricing strategies, as well as to create promotion campaigns that convert better with clients. AI adds value to every stage of the trip selected by the traveller, enhancing his/her tourism experience in the destination as they adjust the itinerary or tour to include more cultural and leisure activities and optimise time in their holidays in an efficient way. One of the keys to the success of AI integration in tourism and marketing companies is that it seeks to improve tourists' experiences in tourist destinations and hotels in a personalised way for each tourist or traveller [74]. Table 1 presents the main advantages of the implementation of AI found in previous studies and reports from public and private organisations. Most authors included in this study argue that AI considerably provides great benefits and new opportunities for companies, STDs, tourists, and residents.

However, implementing AI in STDs to boost tourism marketing and provide better tourism experiences also has its drawbacks and disadvantages, such as its hefty cost and the intricacy of AI, which mean that it is not a possibility open to every tourism city or company (see Table 2). The implementation of AI in STDs can become overly

dependent on automation and run the risk that a vulnerability or cyberattack stops and locks off all operational processes, affecting residents, tourists, and companies. Even so, new technologies are a dilemma for consumers and workers, including reactions to technological inadequacy, mental stress, and task overload [75]. In the same vein, Yeh [76] noted that AI is replacing humans and, consequently, the loss of jobs in STDs. In addition, for those tourists who want to know the culture of local people and take part in these experiences, it is not possible to replicate and stage local experiences and interact physically with travellers through AI technology [77].

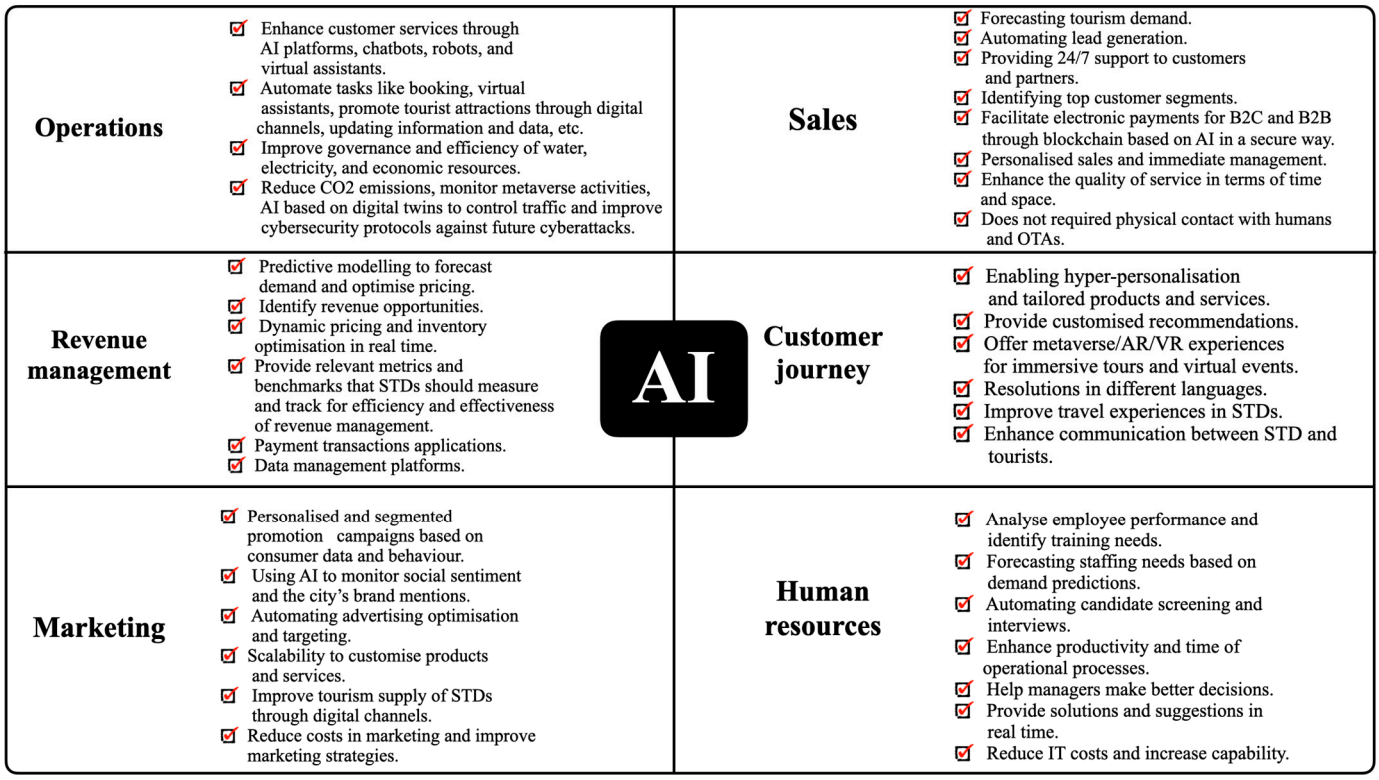


Figure 1. AI technology as a multipurpose tool in STDs. Source [1–4,7–11,13–16,23–33,35,36,44,45,47–68,70–74].

The use of AI technology in STDs enhances public services, fosters tourists and residents' engagement in decision-making processes, and improves STDs' efficiency and productivity.

Table 1. Advantages of the implementation of AI found by previous studies and reports from public and private organisations.

Authors	Literature Citiations	Advantages of AI
Wolniak and Stecula	[78]	Improves governance of STDs.
McKinsey & Company	[67,79]	Helps to segment and personalise marketing campaigns
McKinsey & Company	[67,79]	Helps to create new products and services through innovation processes.
Florido-Benítez	[1]	Enhanced tourist and resident engagement through the adoption of AI-driven chatbots and virtual assistants.
Parvez and Cobanoglu	[2]	Offers an alternative form of communication, reduces costs, and boosts operational safety for organisations.
Buhalis et al.	[4]	Enhances companies' operational efficiency, competitiveness, and customers' experiences.

Table 1. *Cont.*

Authors	Literature Citiations	Advantages of AI
Bulchand-Gidumal et al.	[7]	AI technology improves customer relationship management and revenues.
Zhang and Prebensen	[8]	AI helps create tourism marketing materials.
Coca-Stefaniak; Maxin and Morrison; Carvalho and Ivanov	[10–12]	Enhances the future agenda of STDs.
Dwivedi et al.	[13]	ChatGPT is an effective tool for delivering tailored suggestions to travellers in real time.
Carvalho and Ivanov	[14]	Increases companies' productivity and efficiency.
Doğan and Niyet	[16]	AI systems can provide tailored suggestions for destinations, accommodations, activities, and dining options.
Florido-Benítez	[49,50]	Cybersecurity supported by AI technology helps combat cyberattacks.
Kim et al.; Li and Zhang; Ghesh et al.	[23,35,74]	Enhances tourists' experiences and satisfaction in the tourism and hospitality industries.
Alahi et al.	[24]	The potential of AI to help analyse a vast amount of data to develop new marketing strategies and future trends in STDs.
Future Data Stats	[28]	AI-driven solutions improve public services, traffic congestion, energy consumption, waste management, and residents' quality of life.
Ksheri et al.; Christensen et al.; Dogru et al.; McKinsey & Company	[31,32,54,67,79]	Helps increase sales in organisations and develop marketing plans in an efficient way.
Jevinger et al.	[80]	Provides new transportation solutions to improve transportation systems, making them more efficient, sustainable, and accessible.
Solakis et al.	[44]	Facilitates dialogue in different languages with customers.
Jamshed et al.	[46]	AI technology improves customer services, trip recommendations, environmental sustainability, reduces carbon emissions, and promotes ecotourism to sustain tourism.
Haleem et al.; WEF	[52,56]	AI enhances the brand images of companies and cities, and helps to increase tourism demand.

Table 2. Disadvantages of the implementation of AI found by previous studies and reports from public and private organisations.

Authors	Literature Citiations	Disadvantages of AI
Wolniak and Stecula	[78]	The complexity of integrating AI into organisational systems.
Wolniak and Stecula	[78]	Ensures the protection of consumers' sensitive information and data privacy.
Wolniak and Stecula; McKinsey & Company	[78,79]	A high initial economic investment is required for AI infrastructure, software development, and its ongoing maintenance.
Yeh; Carvalho and Ivanov	[14,76]	AI is replacing humans and consequently the employees lose jobs.
Florido-Benítez	[49,50,81]	The implementation of new technologies by organisations increases the number of cyberattacks and cyberthreats.
Tussyadiah	[82]	The lack of human contact can induce loneliness and anxiety.
Fabregue	[83]	Citizens may not fully understand the benefits of AI technology in STDs.
Smrutirekha et al.	[62]	Bad management of AI technology in companies affects its reputation.

Table 2. *Cont.*

Authors	Literature Citiations	Disadvantages of AI
Chatterjee et al.	[63]	AI is in an experimental state, and thus it sometimes provides information bias.
Yadav et al.	[64]	The use of AI in picking behavioural patterns can sometimes lead to the unwarranted infringement and manipulation of the clients.
Paschen et al.	[66]	Companies and researchers do not have an adequate understanding of how humans and AI technology interact in value co-creation.

That is, there is a progressive loss of tourists' experiences, emotions, and physical interaction with the native population and its culture within STDs that cannot be covered by AI technology in terms of tourism marketing and the representation of the cultural values of places that the tourist cannot see and sense. Another critical weakness of AI is that it uses large volumes of personal and sensitive data of users and consumers to make inferences and create segmented and personalised marketing strategies, and sometimes these data are not correctly used according to the General Data Protection Regulation (GDPR) in the European Union and the AI Act of 16 April 2024 [84]. For example, hackers who carried out a cyberattack on Barcelona's Hospital Clinic in 2023 sold and published all of the medical facility's stolen data on the Dark Web. STDs and private organisations cannot use consumers' sensitive data to promote and communicate marketing campaigns for their own spurious interests. Thus, privacy preservation in AI is very complex due to each one of its stages and processes influencing the entire security system [85].

For instance, the combination of AI algorithms with digital twins (DTs), ML, NLP, Internet of Things (IoT), cybersecurity, websites, the metaverse, quantum computing, and blockchain digital tools is improving to guarantee the security of communications and predicting new models of tourism development in STDs and urban cities. AI makes the metaverse more dynamic because it works with real users to be able to build characters in the metaverse, helping combine STDs' economic activities and the metaverse into an active and creative world [86]. AI-enhanced digital twin models may simulate and visualise data, giving businesses and STDs a greater understanding of their systems' functionality and effects. This facilitates improved communication, teamwork, and decision-making across the stakeholders engaged in business and the infrastructure management of smart cities [87]. Indeed, Singapore has implemented AI-driven traffic systems that adapt to changing conditions, improving overall traffic flow. The city of Copenhagen utilises AI-enabled solutions labs to optimise energy consumption and monitor weather patterns, ensuring efficient energy distribution. And China, India, and Brazil implemented AI technology to ensure the security and privacy of citizen data, which is crucial for maintaining public trust in smart city initiatives.

In the same vein, big data are better managed through AI processes and render faster and more efficient systems in STDs to enhance resilience, safety, and sustainability in their operational systems and processes [88]. It is important to include the ML, DL, and NLP analytical tools of AI in organisations for analysing predictive and consumer data; these digital tools also help protect data and improve data quality. The heterogeneity of big data (e.g., reviews, sensor data, customers' complaints, and vulnerabilities, among others) means dealing with ML, DL, and NLP tools to process in real-time with structured and unstructured data simultaneously, facilitating managers to make better decisions and obtain better results [89,90]. NPL and AI technologies monitor and detect fraud and anomalies, as well as help ensure companies' data privacy and security [91]. In the case of chatbots, an AI-powered chatbot application helps enhance interaction and communication (e.g., different languages and personalised suggestions in real time) between STDs and travellers to provide the best experience for their holidays [13,92,93]. Smart cities like Buenos Aires and Amsterdam use chatbots on their websites to provide personalised suggestions and recommendations for residents and tourists.

Yet, when STDs apply AI algorithms to their marketing processes, it also entails potential cyberattack risks for them and tourists. Indeed, the Federal Bureau of Investigation (FBI) reported that cyber-physical attacks fuelled by AI are a growing threat [94,95]. AI-driven cyberattacks involve using advanced algorithms, leading to rapid intrusions into a company's private information, database destruction, and the theft of users' personal information. Florido-Benítez [49] suggests that STDs and companies must implement cybersecurity measures and protocols to prevent future cyberattacks when they design their marketing plans. The mitigation of the perceived risks and potential hazards associated with AI technologies is a priority in the hospitality industry [96]. In the same vein, Saddi et al. [97] suggest that AI simulates cyberattacks and potential security threats to organisations; thus, this disruptive tool can help STDs and companies improve security contingency plans against future cyberattacks and identify imminent vulnerabilities.

Expert authors and private and public organisations have stated the benefits of the adoption of AI in STDs' tourism marketing and its interaction with tourists, residents, and stakeholders. Figure 2 presents the benefits of this technological tool in an STD context. The implementation of AI in STDs' tourism marketing not only improves tourists' experiences of their holidays, but it also influences the enhancement of residents' quality of life in social and economic terms. For instance, the concept of "Metatourpolis", created by Florido-Benítez [9], refers to the relationship between tourism cities and metaverse platforms to boost universal inclusion, and improve governance, public services, environmental sustainability, and tourism development, as well as attract new investors to create new business opportunities. New technologies must be at the service of the citizens, and not vice versa. Also, AI technologies facilitate the creation of hyper-segmented and hyper-personalised products and services to offer the best experiences to consumers [98] thanks to the proliferation of databases and data analysis that provide a diversification of marketing strategies focused on hyper-segmented and hyper-personalised services according to consumers' needs, preferences, and motivations [99].

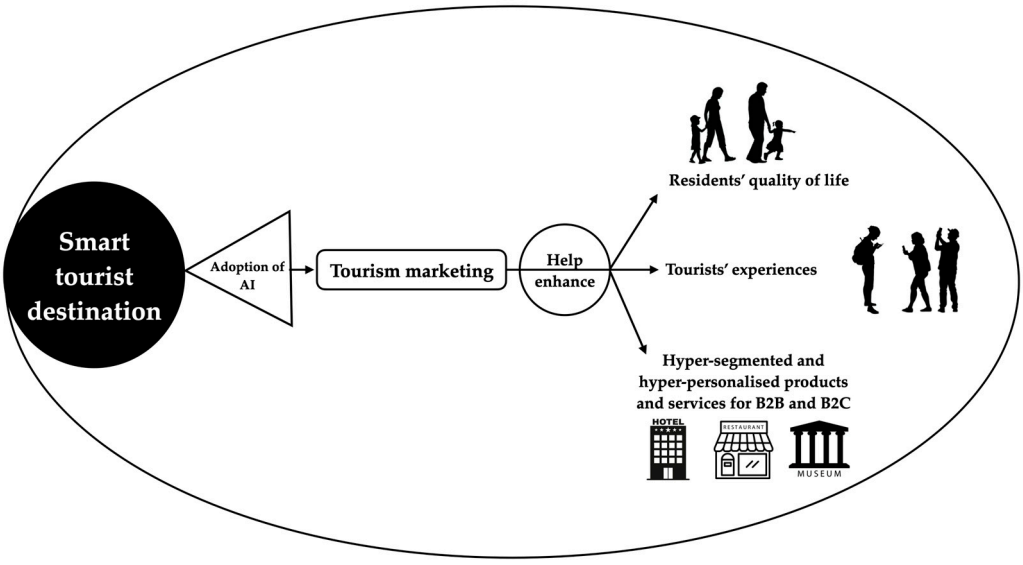


Figure 2. STDs' tourism marketing through AI and its interaction with residents, tourists, and companies.

However, the use of AI applications and platforms by OTAs, airlines, and tourism companies is seriously worrying consumers about the ethical and legal applications of their private and personal information in marketing activities. Alhitmi et al. [100] emphasise the need for transparency in the use of AI by marketing professionals, highlighting the need to keep clients aware of data practices. To build consumer trust and prevent the negative effects of a lack of transparency, businesses and marketers must create ethical guidelines for the development and application of AI-powered marketing tactics. Another challenge

is how AI technology handles information bias, overtourism, and changing tourism trends to face environmental sustainability and climate change.

For example, fake news and manipulated media material can negatively influence the design of AI's marketing strategies and promotion through digital channels. Hence, eliminating biases in AI algorithms is pivotal to increasing the efficiency of processes, and improving the analysis of databases in the long term due to AI technology is considered a sequential procedure. It is important to consider how AI algorithms will analyse and design marketing strategies to mitigate CO2 emissions, climate change, and improve environmental sustainability when the most important countries in the world have different opinions and laws to tackle these serious problems. AI has the potential to significantly reduce climate change, but all governments should jointly handle the planning and governance of climate change through AI to generate new and better synergies that facilitate new actions against climate change [101].

4. Discussion

According to the European Commission's (EC) report, it is expected that between 45% and 60% of all workers in Europe could see themselves replaced by automation and robotization before 2030 [102]. Although the great opportunities presented by integrating AI in STDs can enhance residents' quality of life and tourists' experiences while promoting STDs' sustainability and productivity [24]. In parallel, the United Nations' (UNs) report says that in 2050, more than two-thirds of the world's population will reside in cities [103]. For example, STDs will use AI technologies to manage public services in an efficient and anticipatory way and forecast future urban conditions [25]. AI is revolutionising urban mobility, public services, city planning, sustainable practices, and disaster management thanks to ubiquitous interactions and inferences from vast datasets analysed by AI algorithms that are leading to more liveable and efficient urban environments in STDs [104].

Investment in AI technologies by cities can bring significant benefits, such as improving cybersecurity against cyberattacks, improving labour productivity, and improving the quality of products and services. Obviously, it has been shown that AI enhances the quality of services for tourists and their tourism experiences, and STDs can use this competitive advantage in their promotion campaigns in digital channels. In the same vein, the city of Hangzhou in China integrated AI technology in their operational management, and this notably enhanced the efficiency and quality of tourism services, such as transportation, OTAs, and hotels, as well as communications with tourists, such as different languages, chatbots, robots, photos, and QR codes [105]. In the future, AI platforms and applications will have a strong influence on STDs, their residents' daily lives, and tourists' holiday planning. Thus, it is important to understand to what extent AI creates value and potentially enhances tourists' experiences when they visit an STD or tourist destination [106].

From a tourism marketing perspective, Haleem et al. [52] suggest that marketers and companies will implement AI in marketing processes to monitor consumers behaviours and adjust marketing campaigns appropriately to their needs and preferences. Voda and Radu [107] emphasise the fact that AI increases STDs' competitiveness against their main competitors in terms of economic and tourist developments. Recently, STDs have been the epicentres of innovation and tourism marketing in the tourism industry, and their future is undeniably intertwined with AI. Tuo et al. [105] note that the subversive nature of AI technology will deeply affect tourism experiences, marketing, and services in the following years because this will allow consumers greater autonomy to buy and customise experiences adapted to their motivations and preferences. AI in the retail field helps promote consumer interaction with marketing activities to increase consumption, customer loyalty, and enhance his/her shopping satisfaction [13]. Okumus [108] remarks that the future of the tourism industry will be shaped by the integration of AI and robotic technologies, which will enhance visitors' experiences and autonomy in tourist destinations [109]. However, managers and DMOs would be wise to weigh the pros and cons of these technologies beforehand in order to make more informed decisions going forward.

Additionally, keeping good communication and covering young people's wants and demands is a necessity, and travel and tourism firms are increasingly turning to AI to create and distribute innovative new offerings. Venkateswaran et al. [110] note that bringing AI tools to marketing gives firms the opportunity to expand their operations, individualise their offerings, and boost client loyalty. According to the National Opinion Research Centre's (NORC) survey, conducted at the University of Chicago in October 2023, 53% of young people (14–22 years) use generative AI to obtain information and to ask questions [111]. Therefore, STDs and travel and tourism companies should develop marketing plans and strategies based on the implementation of AI to cover future young people's needs, motivations, and preferences.

Figure 3 presents a structured and categorised framework for future tourism marketing activities and the agenda of AI technology in STDs in commercial, tourists' experiences, and social-economic terms. Information included in Figure 3 was selected from the authors and private and public organisations of each study's references. Each of these terms and actions were extracted from the literature on AI, STDs, marketing, and tourism marketing, as well as public and private organisation reports. This new framework will provide new possibilities for value co-creation, and tourism marketing strategies and actions in the technological landscape of AI for researchers and STDs in the coming years. For instance, AI-based segmentation and marketing can be used to manage and improve tourism flows in overtourism STDs like Barcelona, Málaga, Boston, Copenhagen, Singapore, and Hong Kong. A total of 48% of Spanish people think that tourism is a significant problem in capital cities [112]. Evidence of this are the cities of Venice and Florence, which created a smart control room in order to monitor and reduce tourism flows in its streets according to pressures on public transport and traffic, capacity of accommodation, the nationalities of tourists, and the number of tourists to protect tourists' experiences and residents' quality of life [113,114].

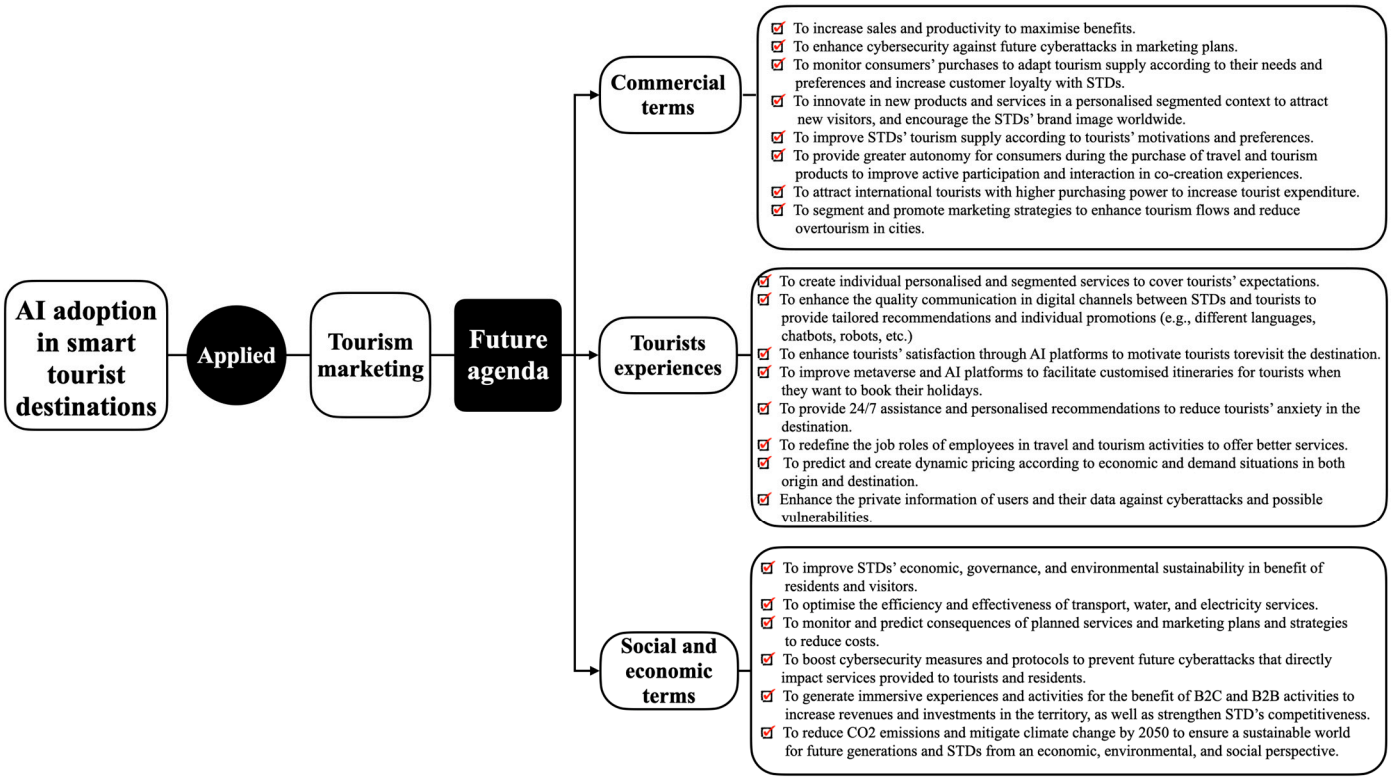


Figure 3. Future tourism marketing activities and agenda of AI technology in STDs. Source [113,114].

Cities' digital tourism marketing strategies are focused on selling and promoting tourism experiences, not flight tickets and hotel books [115], to boost the sustainability of

tourism development in destinations [116]. Some marketing actions through AI require communication via digital channels to position the STD's brand and offer their iconic tourist attractions and competitive advantages to attract international tourists. One of AI's strengths is its ability to automate advertising media and create personalised content in real-time through digital channels for consumers across the globe to position the company's brand image and its strengths [117]. For instance, Zurich, Oslo, and Canberra lead the world ranking of STDs according to the Smart City Index 2024 of the International Institute for Management Development (IMD), showing their strengths in five fundamental pillar areas, such as health and safety, mobility, activities, opportunities, and governance, and positioning them as worldwide benchmarks of STDs [118].

Furthermore, AI platforms are used by STDs and DMOs to assist employees in offering quality services to residents, tourists, and tourism companies, increasing customer loyalty with public organisations. Semwal et al. [119] argue that emotional intelligence and personalised services driven by AI increase consumer engagement with and loyalty to companies because this interaction is empathetic and emotionally engaging. New products and services created by AI enhance functional benefits in a commercial context from the point of view of tourists with AI, strengthening tourist satisfaction with cities and companies that integrated AI in their operational processes [120]. From an STD governance point of view, Zuiderwijk et al. [121] identified the benefits of AI's use in governance, such as improving efficiency and sustainability of economic and natural resources, transport and mobility, and tourism development, helping governments make better decisions to improve citizens' quality of life [122,123]. For example, Tokyo, Toronto, London, Bergen in Norway, and Granada in Spain integrated AI technology to reduce CO2 emissions, enhance energetic efficiency, hospitals' quality of healthcare, administrations' public services, reduce traffic congestions, and improve tourism urban development, allowing them their survival and future sustainable economic and tourism performance [124]. Initiatives such as these create value for tourists and residents, and are promoted via digital channels with the purpose of designing marketing strategies to position STDs as innovative, sustainable, liveable, and efficient cities for travellers. Furthermore, it would be interesting to identify possible physical and digital barriers in STDs through AI applications and algorithms to improve accessibility for blind people and people with reduced mobility, facilitating their access to the main tourist attractions and public services.

Moreover, the adoption of AI disruptive technology in STDs provides new opportunities to create value for marketing services and employees to increase productivity and efficiency, like automating repetitive tasks and complex operational processes. Conversely, the integration of AI technology in STDs also entails potential risks because AI algorithms require the use of large volumes of personal and sensitive data of users to predict future models and design segmented and personalised marketing strategies. The most common risks are malicious malware attacks, possible cyberattacks, and cyberthreats from hackers and cybercriminals, as well as the theft consumers' personal sensitive data to sell on the Dark Web. For example, the Ticketmaster company suffered a cyberattack by the Shiny-Hunters hacking group in June 2024. They had access to the customer details of 560 million clients, and hackers demanded about GBP 400,000 in a ransom payment to prevent the data from being sold on the Dark Web. STDs and travel and tourism companies are one of the main objectives for hackers to develop cyberattacks [49]. We must be aware that the application of new technologies in STDs and companies to provide the best experiences for tourists and residents in the destination carries new risks and challenges, but also opens new business opportunities and markets in the digital world. An example of continuity for improving tourists' experiences in STDs is how AI technology provides customised recommendations and immersive itinerary tours in different languages to increase experiences and satisfaction levels in tourists, as well as boost the communication between STDs and travellers.

However, sometimes risk mitigation measures supported by AI systems can also create new sources of risk; thus, organisations that include AI should adapt to new problems

and vulnerabilities that arise from this disruptive technology [125]. In 2024, the biggest data breaches have surpassed 1 billion stolen records, and cyberattacks are rising in the USA [126]. Indeed, AT&T reported cybercriminals stole the data of its customers (around 110 million people) in 2022. The data was not stolen directly from AT&T's systems but from an account it had with data giant Snowflake. Supposedly, AT&T paid a ransom for the hackers to delete the stolen data [126]. Banks have long used AI and ML technologies to find unusual transaction patterns that indicate fraud. The use of generative AI to identify and tackle vulnerabilities and cyberattacks carried out by hackers and cybercriminals is in the early stages [127]. This study recommends that future studies should include a more thorough risk assessment that identifies potential vulnerabilities within AI systems to guarantee consumers' data security and help companies develop new cybersecurity measures that ensure compliance with governmental and legal regulations. AI helps cybersecurity teams quickly identify possible vulnerabilities and cyberattacks, but it is necessary to examine and extensively apply AI in cybersecurity protocols [128] to combat new cyberthreats like quantum cyberattacks combined with AI technology.

Another relevant finding was that AI is being implemented by STDs and companies in marketing plans and strategies to position their brand image in digital channels, design promotion campaigns that convert better with clients, increase client demand and sales, keep track of purchases, and design pricing strategies according to consumers' needs and capacity of expenditure. For instance, Rio de Janeiro is a smart city that is using new technologies like AI in its tourism agenda to provide better technological solutions for tourists and residents in real time and position its brand image based on two fundamental pillars: tourism sustainability and urban development [129]. We would like to highlight that promoting smart cities' strengths in economic, environmental, efficiency, technological, climate change, transportation, cultural, and leisure terms in digital channels is also seen as a marketing strategy to position the city's brand image as an innovative territory across the globe.

For instance, the use of ChatGPT in promoting tourism marketing performance has the potential to evaluate tourists' motivations and travel intentions with greater precision compared to humans [8]. By integrating ChatGPT into their websites, STDs can provide visitors with a highly interactive and personalised experience. ChatGPT can engage with visitors in real-time, answer their queries, provide recommendations, and offer tailored suggestions. This level of engagement can enhance visitors' satisfaction, increase conversions, and foster long-term relationships with visitors and influence their intention to visit the city again. The adoption of generative AI like ChatGPT into STDs and tourism companies' systems helps generate additional revenue through cross-selling, stimulate tourism demand, and enhance decision-making by tourists, reducing information asymmetry and improving travel planning for visitors [13]. However, sometimes generative AI offers error-filled tourism itineraries for consumers, providing them with bad decisions and experiences in their holidays. Even marketing activities have frequently put profits ahead of openness and the welfare of customers, as evidenced by deceptive advertising and artificial ingredients.

Moreover, the use of AI in STDs' future agendas has the potential to make them more sustainable and efficient, enhance the quality of life for citizens and governance, develop and revitalise a tourism industry to be more sustainable according to tourists and residents' needs and preferences, and reduce the strain on natural and public resources, as we have seen previously in cities such as Malaga, Benidorm, Singapore, Amsterdam, Dallas, Boston, Pittsburgh, Busan, Seoul, Jeju, Hangzhou, Rio de Janeiro, Copenhagen, Hong Kong, Tokyo, Toronto, London, Bergen, and Granada. The investment in AI technologies by STDs helps enhance the quality of products and services, and attracts national and international new investments, which benefit regional economies and the population's quality of life. Big data analysis through AI is being applied in STDs to attract higher economic returns and facilitate future investments in order to create new job opportunities and improve residents' well-being. Thus, AI enhances companies' financial, marketing, and administrative organisational processes [129].

5. Conclusions

The main goal of this manuscript was to show the impact of AI advancements on STDs' tourism marketing to enhance the quality of services and illustrate their future agendas to improve tourists' experiences. The findings of the current study support the idea that AI is a multipurpose tool that helps manage, monitor, and analyse sales information; revenue management; minimise prediction errors; streamline operations; and develop better marketing strategies, optimising economic resources, reducing marketing costs, and responding dynamically to changing needs for tourists and residents in STDs. Indeed, travel and tourism companies are enhancing operational efficiency, safety, and customer services thanks to AI technologies such as ChatGPT, machine learning, and data analytics. For instance, one of the main strengths of AI for STDs is that it has the ability and capacity to instantly create and provide hyper-segmented and personalised services based on traveller customer behaviour or a specific company's needs, helping to reduce cost and time for B2B and B2C.

To sum up, it would be incorrect and naïve to claim that the future tourism marketing activities of STDs' through AI technologies presented in this study will be carried out with all security and speed. Our intention in this study is to provide recommendations about how STDs should implement AI in their future agendas to improve tourists' experiences through tourism marketing activities and strategies, supported by real examples and published scientific studies. For instance, the STD of Pittsburgh in the US uses AI to reduce travel times and wait times of residents and tourists when they take public transport services. The innovation of new products and services through new technologies that facilitate individual segmentation and personalisation helps attract new visitors, promotes the STDs' brand image in digital channels, and empowers the STDs' competitiveness [15,130].

5.1. Theoretical Contributions and Future Scope

This is an exploratory study that offers several theoretical contributions on the adoption of AI to the STD literature. First, the idea of encouraging AI in STDs also must be considered with great care as this digital tool is in an exploratory phase, and we more scientific studies and reports are required from researchers, and public and private organisations to measure their effectiveness and efficiency in STDs and companies. Although our results suggest that AI is a multipurpose tool that provides a multitude of benefits in tourism marketing, this manuscript does not consider the impact of STDs' tourism marketing through AI on consumers' behaviour and their positive and negative consequences. Thus, future studies should tackle the effect of STDs' tourism marketing and AI on consumers. This manuscript did not tackle the risk of losing the human touch in customer service and the dangers of becoming overly reliant on automated systems. Ignoring these crucial aspects in future studies would be a great mistake, because the human touch is a key element to successful services in the travel and tourism industries.

In addition, this study notably contributes to the literature regarding improving tourists' experiences in STDs and tourism cities and is supported by authors [2–4,17,18,35,46,74,131], and others. Future research should explore the impact of AI in tourism cities and STDs in tourists' experience and satisfaction levels by age and familiarisation with this technology. Concerns are raised over the possibility of even more complex forms of deception when AI is used in marketing. AI algorithms that have access to enormous volumes of consumer data can provide highly customised marketing messages that take advantage of people's weaknesses and preferences [132]. Customers might thus be persuaded to buy things that are not optimal for them or may even be detrimental to their health and welfare.

5.2. Implications for Practice

The present manuscript provides relevant practical implications for DTDs and tourism companies. AI-enabled digital marketing is revolutionising the way organisations create content for promotion campaigns via social media and digital channels. Therefore, STDs

and DMOs should implement generative AI to anticipate your customers' needs and make the tourism supply more personalised and segmented to increase revenues and reduce marketing costs. Recently, personalisation through AI in tourism is the new mantra for travel and tourism companies. It would be interesting for companies and STDs to adapt personalised marketing messages in real-time when tourists are enjoying their holidays to increase sales, for example, musical events, discounts in theme parks and museums, and tailored luxury services for people with high purchasing power. Finally, it is important to stress that AI marketing strategies can help to enhance tourists' experiences and satisfaction, as well as the quality of tourism supply [133]. Thus, STDs should consider marketing actions supported by AI technology in their official websites and applications that facilitate the interaction and communication in different languages with tourists against possible frauds, accidents, and other urgent questions, in order to resolve as soon as possible these incidences and reduce their anxiety and preoccupations.

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