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Enhancing Tourist Experiences Through AI-Powered Personalisation in Smart Destinations

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Master (MSc) in Erasmus Mundus in Tourism Development & Culture (EMJMD)

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BUSINESS
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Department of Marketing, Strategy and Operations

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Abstract

This thesis explores the transformative role of AI in enhancing the experiences of tourists within smart destinations, with a particular emphasis on challenges identified around personalisation and privacy. The research design is embedded in a mixed-methods approach, combining quantitative surveys with qualitative interviews to analyze how AI-driven personalisation influences tourist satisfaction, engagement, and overall experience. These are the key elements of AI that are most valued by tourists, and the study goes on to outline how these preferences vary across demographic subgroups. While it shows that AI significantly enhances satisfaction through personal recommendations and content, it brings up concerns on data privacy and the over-personalisation risk, which might undermine user autonomy and trust. It is a study that underlines the ethical considerations that must be weighed, especially with the need for transparency in data practices to keep the confidence of consumers intact. Furthermore, the thesis provides actionable insights for destination managers and policymakers, proposing strategies to effectively leverage AI for personalised offerings without compromising privacy. This research contributes to the academic discourse on AI in tourism and offers practical guidance for integrating AI technologies into the tourism sector to enhance visitor experiences sustainably.

Key Words: Artificial Intelligence; Tourism Personalisation; Smart Destinations; Tourist Satisfaction; Privacy Concerns; Ethical AI

JEL classification:

1. **L83 –** Sports; Gambling; Recreation; Tourism
2. **O33 -** Technological Change: Choices and Consequences; Diffusion Processes

Resumo

Esta tese explora o papel transformador da IA na melhoria das experiências dos turistas em destinos inteligentes, com especial ênfase nos desafios identificados em torno da personalização e da privacidade. O desenho da investigação está inserido numa abordagem de métodos mistos, combinando inquéritos quantitativos com entrevistas qualitativas para analisar como a personalização orientada pela IA influencia a satisfação, o envolvimento e a experiência geral do turista. Estes são os elementos-chave da IA mais valorizados pelos turistas, e o estudo prossegue delineando como estas preferências variam entre os subgrupos demográficos. Embora mostre que a IA aumenta significativamente a satisfação através de recomendações e conteúdos pessoais, levanta preocupações sobre a privacidade dos dados e o risco de personalização excessiva, o que pode minar a autonomia e a confiança dos utilizadores. É um estudo que sublinha as considerações éticas que devem ser ponderadas, especialmente com a necessidade de transparência nas práticas de dados para manter intacta a confiança dos consumidores. Além disso, a tese fornece conhecimentos práticos para gestores de destinos e decisores políticos, propondo estratégias para aproveitar eficazmente a IA para ofertas personalizadas sem comprometer a privacidade. Esta investigação contribui para o discurso académico sobre IA no turismo e oferece orientações práticas para a integração de tecnologias de IA no sector do turismo para melhorar as experiências dos visitantes de forma sustentável.

Palavras-chave: Inteligência Artificial; Personalização do Turismo; Destinos Inteligentes; Satisfação Turística; Preocupações com a Privacidade; IA Ética

Classificação JEL:

1. **L83 –** Esportes; Jogatina; Recreação; Turismo
2. **O33 -** Mudança Tecnológica: Escolhas e Consequências; Processos de Difusão

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Chapter 1: Introduction

1.1 Background and Context:

Artificial Intelligence (AI) has emerged as a formidable influence in the dynamic realm of travel, significantly reshaping the landscape of the tourism industry. The profound impact of AI on aspects such as customer service, operational efficiency, and tailored travel experiences is thoroughly explored in the study by García-Madurga (2023). This research underscores how AI is not merely a technological tool but a transformative element that continuously reshapes the narrative within the tourism sector.

Grundner's, (2021) provides a balanced exploration of AI in tourism, highlighting both the efficiencies it introduces and the ethical considerations it necessitates. This dual perspective acknowledges the positive advancements brought by AI while also addressing the potential challenges its integration poses to the industry.

The broader narrative of digital transformation within tourism is delved into by Gutierriz et al. (2023). Their research decodes how new trends, and digital advancements converge to transform the industry landscape, offering a vivid depiction of the evolving interactions between technology and tourism.

Hasija, (2023). recognizes the pivotal role of AI in revolutionizing the tourism industry on LinkedIn. This acknowledgment goes beyond technological implications, highlighting AI's capacity to unveil innovative solutions that enhance customer experiences across various sectors, including tourism.

The synergy between AI and tourism, focusing on how big data empowers tourists through enhanced decision-making and simplified travel planning. (Barykin et al., 2021). This research emphasizes that the integration of AI within tourism transcends technological boundaries, fundamentally altering the essence of travel and offering new possibilities that redefine the traveller's experience. Each of these studies contributes to an understanding of how AI is not just reshaping but revolutionizing the tourism industry, making destinations smarter and travel experiences more personalised and efficient.

1.2 Problem Statement:

In exploring the changes happening in travel, one big thing stands out: the use of Artificial Intelligence (AI). A report from Intrepid Travel, titled 'A Sustainable Future for Travel,' highlights how AI is playing a crucial role in shaping the travel industry (Clarke, 2023).

McKinsey's insights shed light on the promises and challenges that AI introduces to the travel domain (Cosmas and Krishnan, 2023). The World Economic Forum anticipates a future where AI focuses on providing efficient and highly personalised solutions tailored to individual needs (World Economic Forum, 2023). A study on AI's influence on the travel market reveals that approximately 21 percent of surveyed companies' revenue in the travel sector was AI-influenced in 2021, signifying a substantial impact (Maheshwari, 2024). The convergence of tourism and AI is examined in a comprehensive study by García-Madurga (Sustacha et al., 2023).

Addressing the identified problems in the context of smart destinations is highly relevant due to several key factors that impact the tourism industry's evolution and sustainability. Here are the primary reasons for the relevance of tackling these issues:

A. Enhancing Tourist Experience in Smart Destinations:

Smart destinations leverage technology to create immersive and personalised experiences for tourists. Addressing the challenge of effectively analysing and interpreting diverse tourist

preferences ensures that AI-driven personalisation aligns with the core objective of delivering unique and satisfying experiences (Buhalis and Amaranggana, 2015).

B. Ensuring Ethical AI Implementation:

Privacy concerns arise with the implementation of AI for personalisation. Striking a balance between tailoring experiences and safeguarding tourists' privacy is essential for ethical AI use. Addressing this issue ensures transparency, consent, and protection of sensitive information in smart destinations (Gretzel et al., 2015).

C. Effective Communication of Personalised Offerings:

Despite advanced personalisation capabilities, effectively communicating tailored offerings to tourists is a challenge. Addressing this marketing-oriented problem ensures that smart destinations can convey personalised experiences without overwhelming or intruding on the tourist's journey (Sigala, 2017).

D. Competitive Edge and Industry Adaptation:

As the tourism industry adapts to the digital era, staying ahead is crucial. Understanding and effectively leveraging AI for personalisation can set smart destinations apart, attracting a broader range of tech-savvy tourists seeking innovative and personalised experiences (Neuhofer et al., 2019).

E. Contribution to Sustainable Tourism:

Addressing challenges in AI implementation ensures responsible use of technology, contributing to sustainable tourism practices. This aligns with the broader goals of smart destinations, emphasizing environmentally and socially responsible tourism (Dredge & Gyimóthy, 2015).

Addressing these problems is relevant for creating a seamless and ethical integration of AI in smart destinations, enhancing tourist experiences, and ensuring the industry's competitiveness and sustainability.

1.3 Objective of Study:

1.3.1. To Uncover the Role of AI in Personalizing Tourist Experiences in Smart Destinations:

Explore the intricate mechanisms through which Artificial Intelligence (AI) contributes to the customization of tourist experiences within the context of smart destinations. This objective aims to dissect the specific elements and functionalities of AI-driven personalisation that influence and shape the overall travel adventure. This objective aligns with the need to comprehend the underlying processes by which AI tailors experiences to individual preferences, thereby contributing to a nuanced understanding of the interplay between technology and tourism.

1.3.2. To Evaluate the Impact of AI-Powered Personalisation on Tourist Satisfaction and Engagement:

Assess the direct influence of AI-driven personalisation on both tourist satisfaction and engagement levels. This objective seeks to measure and quantify the effects of personalised experiences facilitated by AI, exploring patterns and variations across diverse travel scenarios. This objective addresses the practical outcomes of AI implementation in the tourism sector, providing insights into how personalised offerings impact the overall satisfaction of tourists and their active engagement in the destination's offerings.

By pursuing these research objectives, this study aims to contribute comprehensive insights into the role and impact of AI in the realm of smart destinations, shedding light on both the operational aspects of AI-driven personalisation and its consequential effects on tourist satisfaction and engagement.

1.4 Research Questions:

1.4.1. Understanding Tourist Preferences for AI-Personalised Experiences:

1. What specific elements of AI-driven personalisation in smart destinations are most valued by tourists, and how do these preferences vary among different traveller demographics?

This question delves into the nuanced aspects of tourist preferences, aiming to uncover the key elements contributing to a positive AI-personalised experience and discerning potential variations across diverse demographic groups.

1.4.2. Measuring the Impact of AI-Powered Personalisation on Tourist Satisfaction and Engagement:

2. How does the implementation of AI-powered personalisation in smart destinations directly influence tourist satisfaction and engagement, and are there discernible patterns across diverse travel scenarios?

This question seeks to quantify the impact of AI personalisation, providing actionable insights into its effectiveness in enhancing both satisfaction levels and overall engagement. It explores variations in the influence of AI across different travel scenarios.

1.4.3. Identifying Barriers and Opportunities in AI Implementation for Tourism Marketing:

3. What are the primary challenges hindering the widespread adoption of AI in tourism, and conversely, what innovative marketing opportunities does AI present for destination managers and businesses?

This question addresses both obstacles and possibilities associated with AI in tourism, aiming to uncover the barriers that may impede its adoption and simultaneously identifying the innovative marketing avenues that AI can open for destination managers and businesses.

These research questions serve as guiding pillars for the study, strategically designed to investigate the intricate aspects of AI-powered personalisation in smart destinations. By addressing these questions, the study aims to provide valuable insights for academia and industry practitioners, fostering a deeper understanding of the role, impact, challenges, and opportunities associated with AI in shaping tourist experiences.

Chapter 2: Literature Review

2.1 Artificial Intelligence (AI)

2.1.1 Definition and Scope of AI

Artificial Intelligence (AI) is the stimulation of intelligent machines that function and act like humans. According to Russell & Norvig (2016), AI is to make things that are rational, intelligent, and understand speech. The goal of AI is to create systems that can operate intelligently and autonomously.

2.1.2 Historical Development of AI

The foundations of AI can be located within classical philosophers who tried to represent human thought as a symbolic system. The formal foundation for AI, however, was in 1956 during a workshop held at Dartmouth College. John McCarthy coined the term "Artificial Intelligence." The workshop represents the beginning of AI as a branch of study. Early AI research took place between the 1950s and 1970s. The focus of the research was on symbolic approaches and is commonly described as "good old-fashioned artificial intelligence" (GOFAI). After that, a decrease in funding occurred, also known as "AI winter," which took place between 1970s and 1980s, because the expectation was not met. But by the late 1980s, AI became a topic of interest again. This was majorly driven by increased computational power and work in machine learning, especially neural networks. It is a system inspired by the human brain, through which functions are learned only by looking at examples and they are not task specific.

2.1.3 The major technologies which AI use include, but are not limited to, the following:

Machine Learning (ML): Is the name for a family of models and algorithms that have at their core the goal of enabling software applications to become more accurate in predicting outcomes without being explicitly programmed. The basic idea behind ML is to develop algorithms that are fed input data. The algorithms predict the outcome using statistical analysis while changing outputs once there is new data.

NLP: This field gives the computer the ability to interpret, understand, and generate human language from speech. The more developed form of NLP powers unrestricted natural language handling where humans are able to interact with computers in natural language.

Robotics: It is a study that involves the construction of robots that can substitute for human actions. Applications of robotics are common in the manufacturing industry and involve accomplishing high precision tasks that are quicker and more enduring compared to humans.

Expert systems: An AI system that provides advice or the right course of action using knowledge databases.

Vision systems: This system translates and comprehends visual input to the computer. Vision systems are used in diagnostic systems since it analyses the image data to diagnose diseases, and in land surveying using drones and satellites (Russell & Norvig, 2016).

2.1.4 AI impact in various fields AI ability has been implemented in various industries:

Healthcare: AI has been utilized regarding processing patient data and making it personalised and predicting disease onset, which contributes to fast and precise diagnosis and good-patient outcomes (Jiang et al., 2017).

Finance: AI is implemented in algorithmic trading, fraud detection, and customer service (Lopez de Prado, 2018).

Automotive: AI is mainly used in constructing safe autonomous vehicles and driver assistance.

Retail: AI personalizes the shopping experience, manages inventory, and coordinates omnichannel retail strategy to boost customer contentment.

Education: AI personalizes learning it uses customization to give students personal path finding, reducing teachers/quizzes time on usage for administrative work by different stakeholders (Tegmark, 2017).

2.1.5 Challenges and Ethical Issues with AI:

AI, being of considerable opportunities, also poses challenges in terms of ethical and pragmatic values. The major ethical issues are privacy, security, and the future of work. Rapid deployment of AI systems may also displace jobs through automation, which is a big concern for any economy. Also, AI systems trained on certain biased datasets may exhibit such biased behaviour leading to practices of discrimination in sensitive areas such as lending, hiring, and law enforcement (Russell & Norvig, 2016). A study of the history of AI, its present applications, and probable future is important for any technology professional and researcher.

2.2 Tourism Industry:

The globalized, multifaceted travel industry significantly adds to the economic, social, and cultural depth of every nation. Tourism is the activity experienced by an individual traveling to and staying away from a regular environment at a place outside their usual environment for less than one consecutive year for leisure, business, and other purposes. United Nations World Tourism Organization (UNWTO, 2019) reported before the recent global disruptions that current tourism now accounted for 10% of global GDP and generated one in every ten jobs worldwide.

2.2.1 Historical Development of Tourism:

Tourism can be seen in many old civilizations, but it developed as a global economic activity at the start of the 19th century with the railroad and steamship travel, which made longer trips more convenient. The period after World War II found tourism gaining and breaking new grounds as the process of globalization was on the upsurge, and gained momentum, powered by significant advances in transportation and a rapidly evolving middle class with higher disposable income. In recent decades, the development of low-cost airlines and the Internet has turned tourism into a mass phenomenon, making travel available to almost everyone and shaping its new tourist destinations (Cooper et al., 2018).

Figure 2.1 – Classification of Tourism

Source: www.pinterest.com

2.2.2 Types of Tourism: Tourism includes a variety of forms with different interests and purposes:

Recreation Tourism. This is tourism for recreation and entertainment, such as a holiday at the seaside, in the mountains, or in a capital city.

Cultural Tourism: This is travel with a primary interest in the tourist destination's culture, art, history, and lifestyle; for example, to attend cultural festivals or visit historical attractions.

Eco-tourism: This is designed to preserve the environment and benefit local citizens by providing responsible travel to natural lands while conserving the environment and raising profit for local citizens.

Active Tourism: This tourist type includes such outdoor activities as hiking, trekking, kayaking, or birdwatching.

Business Tourism: The motive for such travel is commercial, including participation in consultations, conferences, and trade exhibitions (Goeldner & Ritchie, 2012).

2.2.3 Current Trends in Tourism: There are several trends nowadays that shape the tourism industry.

Sustainable Tourism: The increasing awareness of environmental problems results in tourists and tourism business committing more to sustainability: adopting practices that decrease the carbon footprint, protect local ecosystems, and respect cultural heritage.

Technology in Tourism: Travel and tourism are a sphere where digital influence is the most vivid; from booking tickets via the Internet, virtual tours and individual recommendations based on AI and big data, all of these are currently ordinary.

Experience and Wellness Tourism: There is a greater focus on unique and authentic experiences. This tourist type, at the same time, reflects the increasingly important social focus on health and well-being (Dimitrios Buhalis and Costa, 2006).

2.2.4 Economic Impact of Tourism: Tourism is an economic powerhouse supporting local economies through job creation in associated sectors like agriculture, handicrafts and transportation and revenue

generation from direct expenditure on services such as hotels, restaurants, and attractions. Tourism is a fundamental element of economic development and can be a primary source of revenue for many Third World nations (Mason, 2015).

2.2.5 Issues Affecting the Tourism Sector Tourism is affected by some issues that can impact its sustainability in the long run:

Over-Tourism: Popular tourist destinations frequently experience pollution, a breakdown in public infrastructure, and reduced quality of living for local citizens.

Cultural Erosion: The cultural and traditional values of the local people risk being watered down or misrepresented with the commercialization of tourist destinations to appeal to a wider market.

Economic Vulnerability: Overdependence on tourism can expose local economies to global economic shocks and crises, such as pandemics, which can dramatically decrease travel.

Environmental Impact: Tourism can lead to over-expenditure of water and energy, damage of biodiversity, and pollution (Butler, 2024).

2.2.6 The Future of Tourism

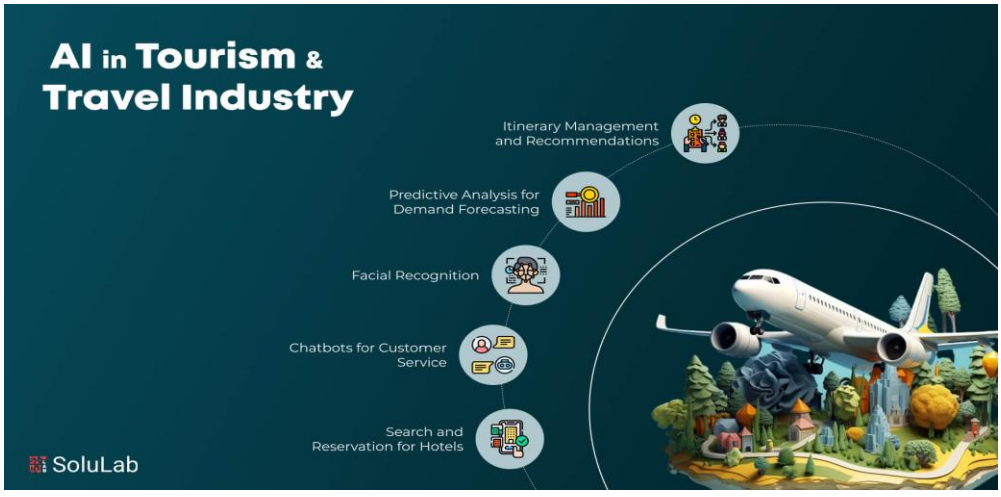
Tourists and other players are increasingly committed to sustainable development due to increased awareness of the environment. The focus can be seen in the preservation of local ecosystems, cultural heritage, and reducing the carbon footprint by the tourism industry (Megan Epler Wood, 2017).

2.3 AI in Tourism

2.3.1 Integration of AI in Tourism

The tourism sector has very rapidly embraced the use of artificial intelligence for two main goals: to better serve customers and to increase operational efficiency. AI technologies have been increasingly embedded in a diversity of tourist-related activities, beginning with travel inquiries to supporting customer care after the trip (Gretzel et al., 2020). This section discusses the promising future across varied AI applications within the industry in dealing with complex operational challenges and rising customer demands. Specifically, Ivanov & Webster (2017) pointed out that AI systems are used for booking automation, managing in-room services, customizing marketing materials, and have strong implications for business-customer interface and in-house processes.

Figure 2.2 – AI Technology in Tourism



Source: www.solulab.com

2.3.1.1 Examples of AI Technologies Currently in Use: Chatbots and Virtual Assistants: Among other applications of AI in tourism, for instance, AI chatbots are increasingly common due to their offering of 24/7 customer service that allows companies to serve their customers without the high costs attached to human representatives. The tools can answer every question, from frequently asked questions about travel destinations to handing booking processes and providing updates on real-time travel. Expedia and Booking.com apply chatbots to advance customer interaction and operational efficiency (Xiang, Magnini and Fesenmaier, 2015).

Recommendation Systems: AI-powered recommendation systems, personalised travel recommendations to be made based on user preferences and past behaviour. They mine through vast vacations of data in suggesting destinations, hotels, and local activities in line with the user's interest and budget. In fact, TripAdvisor uses machine-learning algorithms to tailor travel suggestions and increase user satisfaction and engagements.

Predictive Analytics: To cater to dynamic price changes on the spot and manage inventory based on projected demand, hotels and airlines have started using AI-powered predictive analytics. AI models offer enhanced revenue management strategies, optimize prices, and predict travel peaks in advance. The applications are essential in realizing enhanced profitability and service delivery (Claveria et al., 2019).

Facial recognition technology: Hotels and airports are increasingly using facial recognition technology to facilitate passenger check-in processes and enhance security. This technology is going to assist in quicker verification processing, help avoid queues and improve the overall customer experience very securely.

Language Processing and Translation Tools: AI-driven language processing and translation tools will make this interaction between traveller and service provider easy and effective. AI applications, such as Google Translate, or services integrated into platforms like Airbnb or Uber, allow a person to comfortably navigate foreign surroundings, thus making the entire journey accessible and pleasant. All those AI features around travel apps are part of a trend toward more personalised, efficient, and secure travel. With advanced AI, the application of the same in tourism is expected to rise with further innovations being driven using emerged new technologies that keep changing the face of the industry.

2.3.1.2 AI Technologies Transforming the Tourism Industry: There has been a marked improvement in service delivery and overall operational efficiencies in the tourism sector due to the augmentation of AI technology. Other important AI technologies that are driving the travel and tourism sector are as follows:

Machine Learning and Predictive Analytics: These two top technologies are revolutionizing tourism science into a data-decided sub-sector. Machine learning, with the aid of historical data and understanding of the customers, exhibits a variety of past patterns and then indicates future patterns to help the business in fashioning services in tune with this anticipated demand. For instance, the ability to provide for dynamic pricing structures among carriers that update ticket values in real-time against demand, competition, and extrinsic factors like weather or political stability that help to price tickets correctly. Any increments are thus captured in full by the firm (Claveria et al., 2019). An advanced machine learning algorithm of Marriott International not only caters personalisation of marketing campaigns but also enhances the pricing strategy resulting in an optimal level of customer satisfaction and substantial improvement regarding occupancy rates and revenues (Li et al., 2015).

Customer Service through Natural Language Processing (NLP): In the tourism industry, NLP technology has certainly served as a great revolution for customer service through advanced chatbot and virtual

assistant systems. Such AI-based systems are in the category of those that can understand and analyse human language to provide effective and quick customer service. For instance, Aeromexico's ''Aerobot'' can assist passengers with flight information and booking services, providing customers with more engagement and operational efficiency via some form of natural language interaction as the input/output modality, and respond to common travel questions asked of it (Ivanov & Webster, 2017).

Robotics in Hospitality and Travel Logistics: The use of robotics in the hospitality sector to undertake functions for which human beings have been traditionally hired continues to rise. This includes robots like Hilton's "Connie," named for the company's founder, Conrad Hilton, that greets guests, offers information about tourist attractions, and manages basic guest requests—that is after all geared to better the guest experience. It gives the human staff more time to work on increasingly complex customer service solutions (Ma and Sun, 2020). For travel logistics, they assume the role of luggage handling and transportation. For instance, major airports such as Tokyo's Haneda Airport record regular instances where robots help with luggage and, for example, guide the passengers to the terminal. This helps ease logistics management by ensuring that more operations are done in a cost-effective way and that workers are not exposed to much physical exhaustion (Marcott, 2024).

2.3.1.3 Benefits of AI to Tourism Operators and Travelers: The use of AI in tourism comes with a plethora of benefits that makes the overall experience to the tourist exceedingly brilliant, while at the same time it significantly sharpens service quality and operational efficiencies for the tourism operators.

Enhanced Customer Service and Satisfaction through Personalised Experiences: Previously unattainable, AI-driven personalisation allows tourism operators to tailor their offerings to individual tastes, which greatly enhances customer satisfaction. Data from customers, including reviews, past bookings, and online behaviour, are used to derive personalised travel recommendations and experiences. For instance, AI-generated personalised itineraries have been proven to boost customer engagement and loyalty. Other functionalities, such as chatbots and real-time assistance in quicker ways to answer questions and solve issues, optimized the service experience for the customers with the help of AI.

Greater operational efficiency in booking, managing, and logistics: AI applications make the booking process and management of logistics easier. Minimizing errors possibly made in bookings through automation and the help of AI in travel systems, in which reservations are taken care of, will allow workers to spend their time on other customer activities that are more complex. Furthermore, optimization of hotel/flight bookings will be carried out easily. Adjustments in both price and availability will coincide with demand at peak times (Li et al., 2015). In logistics, it makes route planning better and resource allocation-wise, thus reducing delays to a minimum and enhancing operational productivity, as demonstrated in AI applications in large transport centres (Ma and Sun, 2020).

Enhanced Skills on Handling Big Data to Enable Market Analysis and Strategic Planning: AI is so good in handling and processing huge bulks of data, an important imperative for successful market analysis and strategic planning in tourism. This is because advanced analytics by AI tools are able to unmask the patterns and trends in big data, thus enabling the tourism providers to make informed decisions regarding offering services and their positioning in the market. This ensures that one can predict market changes, therefore, adjusting in real time, which sets efficiency in resource management and competitiveness (McAfee and Brynjolfsson, 2017). For instance, DMOs use AI to analyse visitor data, developing marketing strategies to reach specific demographics and hence be more effective in marketing, increasing marketing efforts, and making the overall marketing resource allocation

efficient. This will increase tourism revenues, which means that more investment will be directed to the tourism industry, raising its value (Gretzel et al., 2018).

2.3.2 Impacts of AI to Tourism Industry

2.3.2.1 Economic Effect: The application of AI in the tourism industry has, therefore, resulted in significant economic effects connected to revenue generation, cost control, and investment patterns. Such changes redefine business practices in the industry, and there are new opportunities for growth and efficiency through them.

AI Revenue Generation and Cost Reduction Implementation: AI technologies implemented in envisioning revenues in the tourism industry include dynamic pricing, personalised marketing, and enhanced customer services. The result is an increase in sales and consequently customer loyalty. Recommendation systems help make offers of packages and deals that are specifically created for customers, and this enhances booking rates. As Gretzel et al. realize, functionalities of the sort can dramatically boost conversion rate given that the website can offer the consumer alternatives that satisfy his or her peculiar needs and wants. AI also yields enormous cost reduction by optimizing resource allocation and operational efficiencies. For example, AI-based algorithms can forecast when there is likely to be high demand and a need for capacity so, that there can be accurate planning for employee shifts as well as inventory levels at which time waste and operation expenses will maximize savings. For instance, airlines and hotels can use AI to increase their load factors as well as room occupancy rates to the maximum, hence maximizing revenue per available seat or room, respectively, and minimizing under-booked flights or rooms to minimum cost (Li et al., 2015). Automated customer service solutions, such as chatbots, reduce the need to support a large customer service workforce while improving, or at least maintaining, service quality, thereby driving further cost efficiency forward (Xiang, Magnini and Fesenmaier, 2015).

Investment Trends in AI in Tourism: Tourism has been making investments in the AI market over time, given its potential to influence operations greatly and be one of the key differentiators. According to McAfee & Brynjolfsson (2017), even previous initiatives, which are currently being funded –keeping in view that they are basically start-ups or new programs – the focus is really on how to integrate AI into the service provision, for e.g. provide sophisticated booking platforms and travel Starting action.

2.3.2.2 Social Impact: Artificial intelligence in the tourism industry has some important social consequences: changing landscapes of employment, behaviour in tourism, and questions of ethics. Knowledge of such social dimensions in the development process of AI technologies in the domain of tourism is of fundamental importance to the underpinning of their ethical application.

Real-world Analysis of How AI Impacts Employment in Tourism: The impact of AI on employment within tourism is two-fold. New employment opportunities are created with the sophistication of technical skills in the management of AI systems, data analysis, and maintenance; it could help create a more skilled labour force and thus, potentially increase levels of income in tourism (Tussyadiah, 2020). On the downside, however, AI will potentially displace jobs, in most cases, those in which a human would be having hardly any interaction that goes beyond basic customer service or other equally repetitive tasks. For example, chatbots and automated booking systems both could eliminate the need for front desk staff and call-centre agents. AI has a range of productivity benefits and can cut operational costs, although it reduces entry-level positions which traditionally have provided skills development for unskilled tourism labour.

Impact on Tourist Behaviour and Expectations AI advances have further modelled tourist expectations and behaviours. AI embedded into the psychic landscape of the modern tourist can make suggestions

that best suit the tastes and preferences of an individual. AI-powered recommendation engines can put forward much better choices of activities, destinations, or dining places that are tailor-made to individual needs (Gretzel et al., 2020). Moreover, AI-based services, from voice-activated room controls to the ability to use a personal travel assistant run by AI, among others, are setting a new standard for customer service in the industry and moving it toward being more responsive in its delivery intensity (Xiang, Magnini and Fesenmaier, 2015).

Ethical Considerations and Social Acceptance of AI in Tourism: As the acceptance of AI in tourism increases, multi-ethical considerations arise relevantly. One of the main concerns includes data privacy, with huge amounts of personal data being required for proper work by such systems. Ensuring that the data is collected, stored, and used in ways that respect privacy rights is overly critical. These are the same algorithms that make AI a tool for discrimination because, if biased, such will be the case. If subjected to a biased dataset during training, an AI system, especially one used in hotel bookings, for instance, will turn around and offer different prices or levels of service to customers depending on their demographic profile (Maltby, 2019). Other than ensuring transparency and trust, social acceptability of AI in tourism is built. The tourist and workers must have the ability to determine how AI systems make their decisions and alter them. This may also reduce fear and establish at least some level of confidence if AI is presented clearly and its benefits are conveyed to the audience (Koo et al, 2021).

2.3.2.3 Environmental Impact: AI provides powerful tools to enhance environmental sustainability within the tourism sector. In achieving all the functions of optimizing resources, predicting impacts, and facilitating better-informed decision-making, the contribution of AI to enabling practices that will turn out to be sustainable over time cannot be easily overlooked.

How AI Can Help in Sustainable Tourism Practices: One of the areas where AI will particularly go on to help sustainable tourism will be in optimizing resource and energy utilization. For example, an AI system can manage an HVAC unit by dynamically changing its settings based on occupancy and current weather conditions. Besides, AI helps the tour operators and DMOs to understand tourist flows and behaviour patterns with a view to manage destinations in a manner that minimizes environmental disturbance and works out carrying capacities (Li et al., 2015). With respect to making it possible to conduct the activities resulting from the tourism industry without environmental degradation, AI technologies can actually be helpful in the monitoring of environmental conditions and wildlife within natural sites. For instance, the sensors on camera-supported drones can follow up on the number of wildlife populations and their habitats, thus providing non-intrusive data that supports conservation efforts.

AI for Environmental Footprint Management in Tourism Activities: The AI substantially helps in devising the most rational way for increasing the reduction of the carbon footprint associated with the tourism activities, primarily through improvement in the logistics of transportation. It is the support for optimizing travel routes of airlines, cruise ships, and ground transport, such that not only fuel use is minimized but also decreasing fuel emissions. For instance, an AI algorithm can factor in weather and traffic conditions when plotting real-time highly fuel-efficient routes. It also helps in managing waste at tourist destinations by predicting patterns of garbage generation, optimizing collections, and processing strategies. Its predictive capabilities ensure that recycling and waste disposal are managed as effectively as possible, hence reducing the overall impact on the environment (Gössling et al., 2020).

AI has huge potential to enable sustainable tourism development through the purposeful development of tools that help diminish the direct environmental impacts of tourism activities and force a shift in the industry's behaviours toward results-focused practices. It is a necessary shift to

make the global tourism industry align with larger environmental goals and commitments taken by the United Nations, as reflected in the Sustainable Development Goals.

2.3.3 Challenges of AI Application in Tourism

While integrating AI into the tourism industry can have great benefits, there are bound to exist several challenges that such integration will bring in the wake of it. These would range from technical issues, matters pertaining to ethics, and resistance by conventional operators to the proper use and adoption of the AI technologies.

2.3.3.1 Technical Challenges- Data: The biggest technical challenge that remains in implementing AI in tourism is data integration. Data in the tourism sector are heterogeneous; different data systems are dispersed among different service providers, such as airlines, hotels, and booking platforms. Bringing this together to make effective use of AI will take both time and resources. Moreover, the variations in data inconsistency, quality, and format make this process more complicated (Gretzel et al., 2020). Security is another grave concern, as financial and personal data in humongous volumes are at stake with AI systems, making them prime targets for cyber-attacks. There ought to be very robust security measures to lock data to retain confidential information besides maintaining trust from the partners and the customers themselves (Li et al., 2015).

2.3.3.2 Ethical Issues- Privacy and Algorithmic: Huge volumes of personal data feeding the artificial intelligence (AI) systems that seem to have insatiable data hunger raise significant privacy concerns and algorithmic biases, which are pertinent ethical issues associated with applying AI in tourism. Without access to vast masses of personal data, these AI systems cannot possibly operate. This raise concerns related to privacy. If not strict controls and transparent data practices are put into place, it might be possible for personal information to be loosely connected without there being clear boundaries of practice between simple violations of privacy and extreme social injustices. Such systems can also result in ethical challenges regarding the algorithms' bias. AI systems, after all, can be biased based on the data conditioning it. This may result in the misrepresentation of a destination or unfair treatment of some customer groups in the tourism industry. Bias should be expressly accounted for at the design and training level of AI development so that the results are totally impartial and do not discriminate against any sections of society (Ivanov et al., 2017).

2.3.3.3 Resistance from Traditional Tourism: Traditional tourism tour operators have a mindset of resistance to implementation, whereby AI technology could be seen as a threat to traditional business models or human employment. Fear of job displacement and misunderstanding about the capability of AI and its benefits usually top the list of reasons for such a resistance. Overcoming this, therefore, involves the indication of value addition from AI, the training of staff to work with rather than against AI systems, and the demonstration of the fact that AI can supplement rather than replace human roles (Gössling et al., 2020).

2.3.4 Creative applications of AI in tourism

The integration of AI into the travel and tourism sector is paving the way for innovative pathways through which the future of the industry will be reshaped. This section covers some pioneer applications of AI in augmenting prediction capabilities, personalizing the experience of tourists, and the synergetic application of it with other cutting-edge technologies.

2.3.4.1 Predictive Analytics for Future Tourism: The growing exploitation of AI tools, especially predictive analytics, has seen the tourism industry become increasingly reliant on them to predict emerging trends. Sometimes a simulation of hypothetical model solutions can be generated to

ascertain likely future travel demands. Solutions can then be used to adjust service offers in the future. For example, it is possible for AI systems to project some destinations that will, in the subsequent years, become popular and therefore allow machinery for strategic adjusting early enough. For instance, in Mariani et al. Organizationally, predictive analytics can support business entities in their risk management approaches by forecasting possible disrupters of markets as part of the economic, political, and environmental impactors—an organization's market drive to its products and services.

2.3.4.2 AI-driven Customization of Travel Experiences: AI-driven personalisation probably presents one of the strongest applications in tourism. Ceding way behind the scenes, AI algorithms scrutinize individual preferences, past behaviours, and context-aware data in deriving personalised travel recommendations, ranging from accommodation to activities. This provides customers with superior experiences, which encourage their loyalty and repeat bookings. Hotels and travel agencies have been using AI for preparing customized itineraries for their clients according to their interests and budgeted amounts, which has led to higher levels of customer satisfaction, consequently yielding better business performance.

2.3.4.3 The Artificial Intelligence Integration with Other Emerging Technologies: Put AI together with other emerging technologies such as IoT and blockchain, and it would open a world of innovation possibilities in tourism. This could perhaps improve customer experiences through intelligent features borrowed from AI, embedded in IoT devices for smart rooms that made automatic adjustments based on guest preferences or behaviour, or wearables that provide real-time guidance to tourists while touring destinations (Gretzel et al., 2021). The combination of AI and blockchain will create more secure, transparent, and effective data within the management of tourism. Secure-AI-stored data in such a huge volume will facilitate data sharing across the tourism industry without violating the privacy or security of the owner. It can also protect manipulation through reviews and ratings, which has become a common issue in the tourism industry (Nder and Treiblmaier, 2018).

2.3.5 Future of AI in Tourism

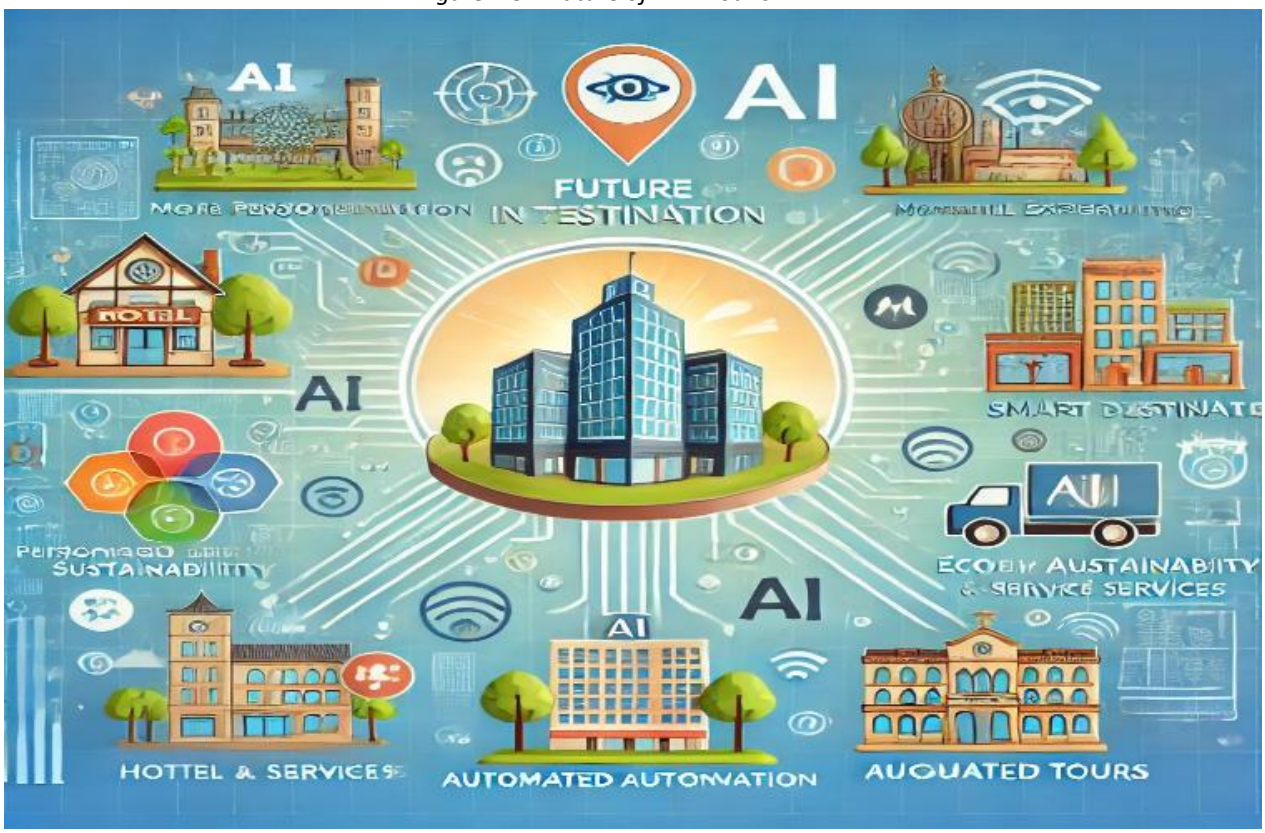
It is argued that expert predictions and future developments are going to bring a complete shift in the way service is delivered and experienced within the tourism sector using AI technologies. This section deals with anticipated expert predictions, potential for developing capabilities from AI, and points out the evolving challenges and opportunities posed by AI technologies for tourism.

2.3.5.1 Expert Predictions and Industry Forecasts: Indeed, the experts from the outset predict that AI will spur new innovations in customer service, personalised experiences, and operational efficiency in the tourism sector. Once AI is introduced, travellers will have access to hyper-personalised, real-time travel experiences that will change the ways services flex for the individual, whether accommodations, transportation, or entertainments. Together with this is its crucial role in managing crises and conducting scenario planning; this allows firms to face challenges better and with greater resilience toward them.

2.3.5.2 Potential for Growth in AI Capabilities and Adoption Within the Industry: The potential for growth in the capabilities of AI and its adoption in the tourism industry is extensive. Other machineries in tourism activity that AI will step into after their further development include the ability to influence any mechanism of this industry, from supply chain management to post-trip customer engagement (Li et al., 2020). More and more tourism businesses turn to AI for its recognized benefits; adoption rates are supposed to increase, leading to more sophisticated implementation using AI for strategic insights and service improvement (Xiang et al., 2021).

2.3.5.3 Opportunities in AI Evolution: As AI continuously grows and intensifies, the development proves to have tangible disruptions for the tourism sector. To be able to cope and assure competent training for employees on how to apply and control all these new tools, it will be a challenge. Confidence in the customer is also to be upkept when services are automated increasingly (Neidhardt & Werthner, 2018). Nevertheless, there are also possibilities that AI opens for the tourism sector, ways in which practices of sustainability are upgraded significantly: namely in resource use efficiency with waste minimization. This can be complemented using AI-driven tools, which will offer the travellers with disabilities tailored information and services.

Figure 2.3 – Future of AI in Tourism



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Chapter 3: Theoretical Framework

3.1 Theoretical Underpinnings of AI in Tourism

3.1.1 Cognitive Computing and AI:

Basically, cognitive computing in artificial intelligence refers to systems that learn at scale, reason with purpose, and interact with humans naturally. Otherwise, the systems are set to have a mimic of human brain function in a computerized model that will handle complex problem-solving (Kelly III and Hamm, 2013). In the tourism industry, cognitive computing could further boost service personalisation and responsiveness in providing recommendations and support that are attuned to individual needs.

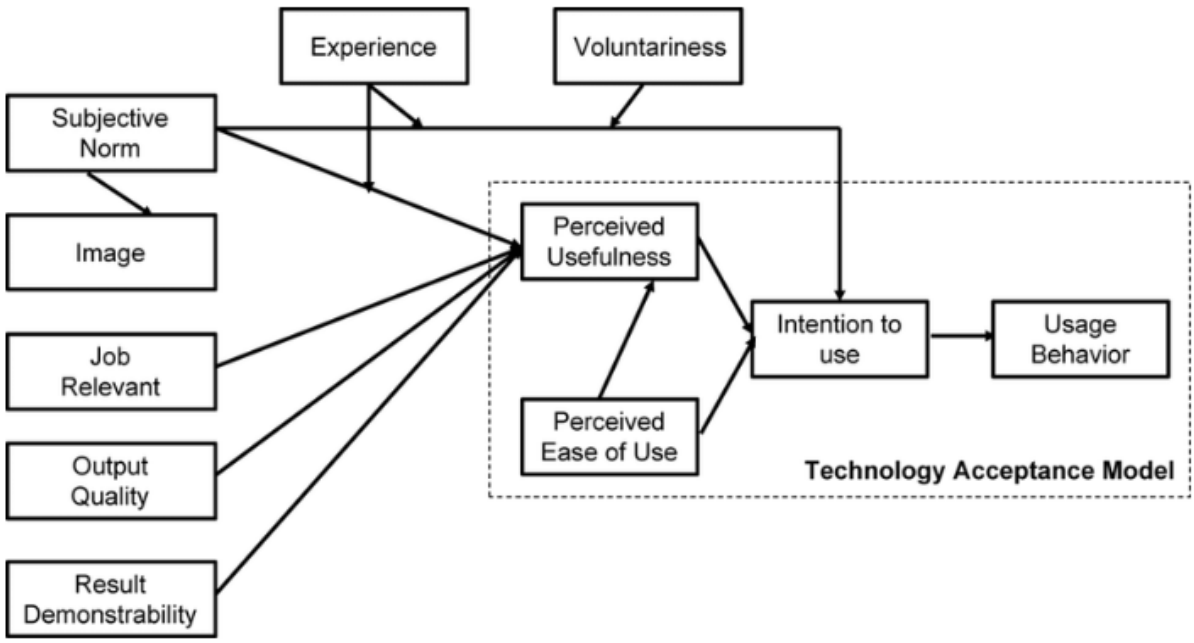
Application in Tourism Industry: General criteria for cognitive computer systems involve utilizing techniques like data mining, pattern recognition, and natural language processing to simulate human thought within a controlled environment. For example, natural language queries of tourists could be processed to come up with personalised travel advice or suggestions on itineraries to improve the decision-making process of travellers (Gretzel et al., 2015).

3.1.2 Technology Adoption Theories:

Review of Classic Approaches:

Technology Acceptance Model: Developed in 1989 by Davis, TAM describes how users finally come to accept and use a technology. The model proposes that perceived usefulness and perceived ease of use will determine someone's intention to use a system with the said intention, to predict actual usage. A Unified Theory of Acceptance and Use of Technology with the UTAUT as integrated components from various theories of technology acceptance. Performance expectancy, effort expectancy, social influence, and facilitating conditions were all significant predictors of technology adoption and usage according to the theoretical model (Venkatesh, et al. 2003).

Figure 3.1 – Technology Acceptance Model



Source: www.researchgate.net

Applications in the Tourism Industry: This has henceforth become possible for the scrutiny of the perception that the tourists and the industry operators hold towards the adoption of such technologies. For instance, perceived usefulness will influence the acceptance of AI chatbots in hotels, whereas perceived ease of use will affect the willingness of the tourists to interact with such systems. UTAUT can further explain the social influence and facilitating conditions of the adoption of AI technologies in tourism: organizational and computer infrastructure.

3.2 Personalisation Theories of Tourism

3.2.1 Concept of Personalisation

Definition of Customization on Tourism: Tourism personalisation will imply making services and experiences relevant to the individual's specific needs and preferences. Data-driven insights will help create a curation—from hotel accommodation to the activities in a tourist area, communication, and recommendation of several other elements in which a given travellers would be interested. This approach offers an experience that is more relevant and enjoyable for every kind of tourist.

Psychological and Behavioural Issues: In line with Deci and Ryan (2000), personalisation taps into fundamental psychological needs for autonomy, competence, and relatedness. In offering the innovative tourist a myriad of tailor-made experiences in tourism choices, personalisation enhances the feeling of competence while trying out options that would meet individual preferences. It also ensures relatedness: the travel experience links to one's personal identity and lifestyle choices. Personalisation has a significant effect on satisfaction in most cases, which throws up actions with word-of-mouth communication and regard across the experience.

3.2.2 Theoretical Models of Consumer Behaviour Theoretical Integration

Theory of Planned Behaviour: TPB is a concept proposed by Ajzen in the year 1991. According to it, a person's behavioural intention leads to behaviour, given that the intentions are a function of attitude towards the behaviour, subjective norms, and perceived behavioural control. This theory can be applied to explain how AI-driven experiences personalise the travel choices and behaviours of tourists.

Implementation in AI-Driven Tourism Personalisation: Applying TPB in this manner allows one to assume that tourists' attitudes about personalisation driven by AI, such as receiving personalised suggestions about their travel made by the AI algorithm, might predict their intention to use these technologies. Subjective norms could consist of perceptions from peers and family views about AI in tourism likely to influence acceptance and use of personalised services among tourists. Behavioural Control Perceived behavioural control is the ease the tourist feels can be had of using the AI technologies. It is also a very important factor that could significantly influence engagement with personalised travel platforms (Ajzen, 1991).

3.3 Business Process

3.3.1 Analysing the principles underlying AI and BPR:

Business Process Reengineering (BPR) is a management strategy focused on the analysis and design of workflows and processes within an organization, aiming to bring about major changes in key aspects of cost, quality, service, and speed (Hammer and Champy, 1993). The AI adoption in tourism may be practiced in conformance with Business Process Reengineering guidelines to redefine conventional ways of carrying out several tourism business processes and achieve operational efficiencies with a high degree in customer services. For instance, AI-enabled solutions automate repeated tasks,

streamline booking and check-in workflows, and enable personalised customer interactions to cut overhead costs and improve service delivery.

Uses in Tourism: Adding AI in accordance with BPR requires the re-design of current operational processes. An example of this is to remove the manual customer services point and add AI chatbots. Not only would response time drop significantly but so too would customer satisfaction increase dramatically via 24-hour support. "For example, artificial intelligence can streamline resource allocations in hotels and resorts, as anticipation levels of both staff levels and utilities must be aligned with guest expectations and occupancy" (Kaplan and Haenlein, 2019).

3.3.2 Lean Management and Artificial

Discussion about Integration of Lean Principles and AI: Lean management offers a way that supports the elimination of waste in a system for production without necessitating a reduction in the level of productivity. However, this is done by various methods; focus is on the principles of value stream mapping and continuous improvement. How can AI be applied to the tourism industry using lean principles to improve efficiency and quality of customer service by minimizing wastage in inventory management, engaging the customers, and servicing them.

Application in Tourism: AI technologies can be applied to reveal inefficiencies in service delivery, for example, overstaffing during low occupancy or underutilization of resources that lean management seeks to eliminate. For example, AI-powered analytics tools could make forecasting more precise, thus allowing for more efficient scheduling of staff and inventory, which will ultimately reduce overproduction and waiting times—both considered core wastes in lean theory (Shah and Ward, 2007).

3.4 Sustainability and AI in Tourism

3.4.1 The theoretical point of view on sustainable tourism:

Analysis of Theoretical Foundations: Sustainable tourism theories underpin management of resources in a way that includes meeting economic, social, and aesthetic needs but without compromising cultural integrity, essential ecological processes, biological diversity, and life support systems (Butler, 1999). Many of these theories stress long-term viability in tourism without this present development and use of resources failing to meet the needs of future generations.

Contribution of AI for the Achievement of Sustainable Tourism Objectives: In this way, artificial intelligence will not only save resources but also enhance the process of decision making. Artificial intelligence should be used in the analysis of big data from many different sources toward giving insights into the effective management of the flow of tourists with reduced negative impact on the environment. For example, AI-based predictive analytics can help in forecasting tourist numbers for better management of visitor impact on sensitive ecosystems. For instance, predictive analytics based on AI could foresee the number of tourists; it prescribes better management of the impact of visitors on sensitive ecosystems.

3.4.2 Role of AI in Environmental, Economic, and Social Sustainability:

Environmental Sustainability: AI can greatly contribute to environmental sustainability in tourism by optimizing energy use and waste management. An example is given by the smart AI systems controlling energy consumption in hotels, which can dynamically tailor the heating, ventilation, and air conditioning of the hotel to real-time occupancy information so that unnecessary energy disposal does not occur (Boes, Buhalis and Inversini, 2016).

Human Sustainability: Economically, AI technologies enhance the sustainability of the tourism sector by improving efficiency and profitability. For instance, AI technologies like dynamic pricing models are used in maximizing the revenue for tourism operators through demand-based strategies, weather conditions, and events that take place in a city, among other such factors. Business entities thus remain economically viable without leading to price hikes during peak seasons (Li et al., 2020).

Social sustainability: In the same social dimension, just but a few of these lies in the promotion of fair practices and improving the experience for tourists. AI tools equip personalised tourism information, promoting local culture and heritage due to respect for community values and traditions. Moreover, AI can greatly help improve accessibility to tourism for disabled and elderly tourists, thus making the process more inclusive. In all such socially responsible ways, they shall be the ones benefiting from the AI applications—offering options for experience customization in a way that values the community's good and tradition.

3.5 Theoretical Insights into the Ethical Consideration

3.5.1 AI Ethics

Review of Ethical Theories

In the context of AI, ethical theories generally involve frameworks formed to guide decision-making based on developing and deploying technologies. Two overwhelming theories in this context are:

Deontology: This stream in moral philosophy by Immanuel Kant is basically anchored on duty, rules, and obligations. Translated to AI ethics, that basically could translate to an in-built obligation for developers—to create systems adhering inviolably to norms and across ethically guided lines, come what may.

Utilitarianism, advanced by Jeremy Bentham and finally revised by John Stuart Mill, mainly focuses on the outcomes, and argues that the best moral actions are those that lead to the greatest happiness or well-being of the greatest number. Writ large, the application of this theory into AI will therefore focus on actions and decisions with maximum overall benefits, which would generally be efficiency, effectiveness, and satisfaction (Sinnott-Armstrong, 2020).

Some AI Implementation towards Tourism:

Deontology: Developers and operators of the systems in the tourism industry may act based on deontological ethics by making AI systems transparent, responsible, and adhering to predefined ethical standards that treat user privacy with respect.

Utilitarianism: the utilitarian ethic will guide AI technologies that are intended to maximize management of economic resources, enhance tourist experiences, and better the economic outcomes for communities, while at the same time weighing these benefits against possible downsides such as job replacement or cultural loss.

Discussion on Concerns of an Ethical Nature:

A few ethical considerations that should be regarded with the use of AI in tourism:

Privacy: AI systems will, in most cases, need to collect substantial amounts of data to be able to function properly. This poses significant privacy challenges in matters related to personal information about tourists. Data collection, storage, use, and sharing need to follow stated privacy standards to prevent misuse.

Monitoring: AI in security and service management when it comes to tourism can be further boosted with better monitoring capabilities. Although it can vastly enhance the angle of safety, this, to an extent starts raising questions on collateral security vis-à-vis the erosion of the individual's rights to privacy and freedom (Lyon, 2014).

Data breaches are also part of an infractions database linked to AI; this system can reveal sensitive personal and financial information, giving rise to enormous workability and ethical issues.

3.6 Synthesising Theories into a Coherent Framework

3.6.1 Integration of Theories

Proposed Aggregated Framework: Hence the synthesized theoretical framework proposed here will be a blend of the discussed theories and will prove to be sounder enough to present a holistic understanding of AI implication in Tourism. The synthesis will incorporate elements from:

The capability to simulate the human mind in cognitive computing and AI can be gauged through influences on decision-making in tourism.

Technology Adoption Theories: The models will help in understanding the adoption and usage of AI technologies by tourists and tourism operators: perceived ease of use, perceived usefulness, and social influence with respect to the innovation under consideration.

Personalisation theories and TPB toward tourism models: this further integration will give insights on how AI-driven personalised experiences are going to shape tourist behaviours and satisfaction.

Operational Theories (BPR and Lean Management): These theories will be applied to explain how AI could streamline operations and enhance efficiency in the tourism industry culled from Hammer, M., and Champy, J. (1993), Womack, J.P., and Jones, D.T., Roos.

It is aimed at evaluating how AI could be employed to ensure that tourism practice is sustainable and cater for some of the ethical issues, such as privacy, surveillance, and data security.

The paradigms provide for the assessment of AI improvements in operational effectiveness and tourist experience, as well as the evaluation of AI applications in operational efficiency and effectiveness.

3.6.2 Proposed Hypothesis

From the theoretical framework above discussed, the following hypotheses arise, to be tested in subsequent chapters:

Hypothesis 1: High perceived usefulness and ease of use of AI in tourism technologies are associated with high adoption levels of tourism operators and high satisfaction rates between tourists.

Hypothesis 2: The level of personalisation enhanced by AI has a significant effect on the satisfaction and engagement of tourists, which can be determined from the Theory of Planned Behaviour.

Hypothesis 3: AI adoption from the perspective of BPR and Lean Management will significantly improve operational efficiencies and reduce operational waste in the tourism industry.

AI-driven interventions that preserve the required standards for AI ethics, including data security and privacy protection, are more likely to be acceptable by users and will have less negative social impact.

Hypothesis 5: Artificial intelligence in the practice of sustainable tourism tends to offer better results for destinations in terms of the environment, economy, and social outcome.

These will shape an approach to research that directly investigates the effects of AI applications in tourism, guiding an empirical analysis in the following chapters. Ultimately, they contribute to a deeper understanding of how artificial intelligence, in general, can be effectively and ethically integrated into the tourism sector.

3.7 Summary

3.7.1 Summary of Main Theories:

This chapter discussed key theories which demonstrate rigor in understanding the implications of artificial intelligence (AI) in tourism. They include:

Cognitive Computing and AI: Illustrates how AI can have the capacity to reach reasoning levels, to be in decision leadership, and to be personalised within tourism.

Technology Adoption Theories: TAM and UTAUT: Theories of technology adoption suggest that perceived usefulness, perceived ease of use, social influence, and facilitating conditions drive the intention to adopt AI technologies in the tourism industry (Davis,1989) and (Venkatesh et al.,2003).

Personalisation Theories and TPB Consumer Behaviour Models: AI-driven personalisation and its impact on the behaviours and satisfaction of tourists using theories like the Theory of Planned Behaviour (Ajzen, 1991).

Operational Theories (BPR and Lean Management): This paper intends to examine how AI fits into the theories of Business Process Reengineering and Lean Management, which are geared toward the optimization of tourism operations and cost/profit efficiency.

Sustainability and Ethical Considerations: Discuss how AI can buttress sustainable tourism practices and explain ethical considerations that are occurring in relation to privacy, surveillance, and data security (Tavani, 2016).

Application of Theories in Later Chapters:

The theories outlined in this chapter will be used:

Data Analysis: The synthesized theoretical framework will guide data analyses from empirical aspects of the study. Such a framework is likely to bring out patterns and relationships of AI adoption and its impact on other varied fields within the tourist industry.

Discussion of Findings: The findings are discussed in relation to the frameworks in a manner that reflects or contradicts existing theories of technology adoption, personalisation, operational efficiency, and ethics in tourism. This will further help us fine-tune our understanding of how AI is working within tourism, suggesting practical implications for industry stakeholders.

Chapter 4: Methodology

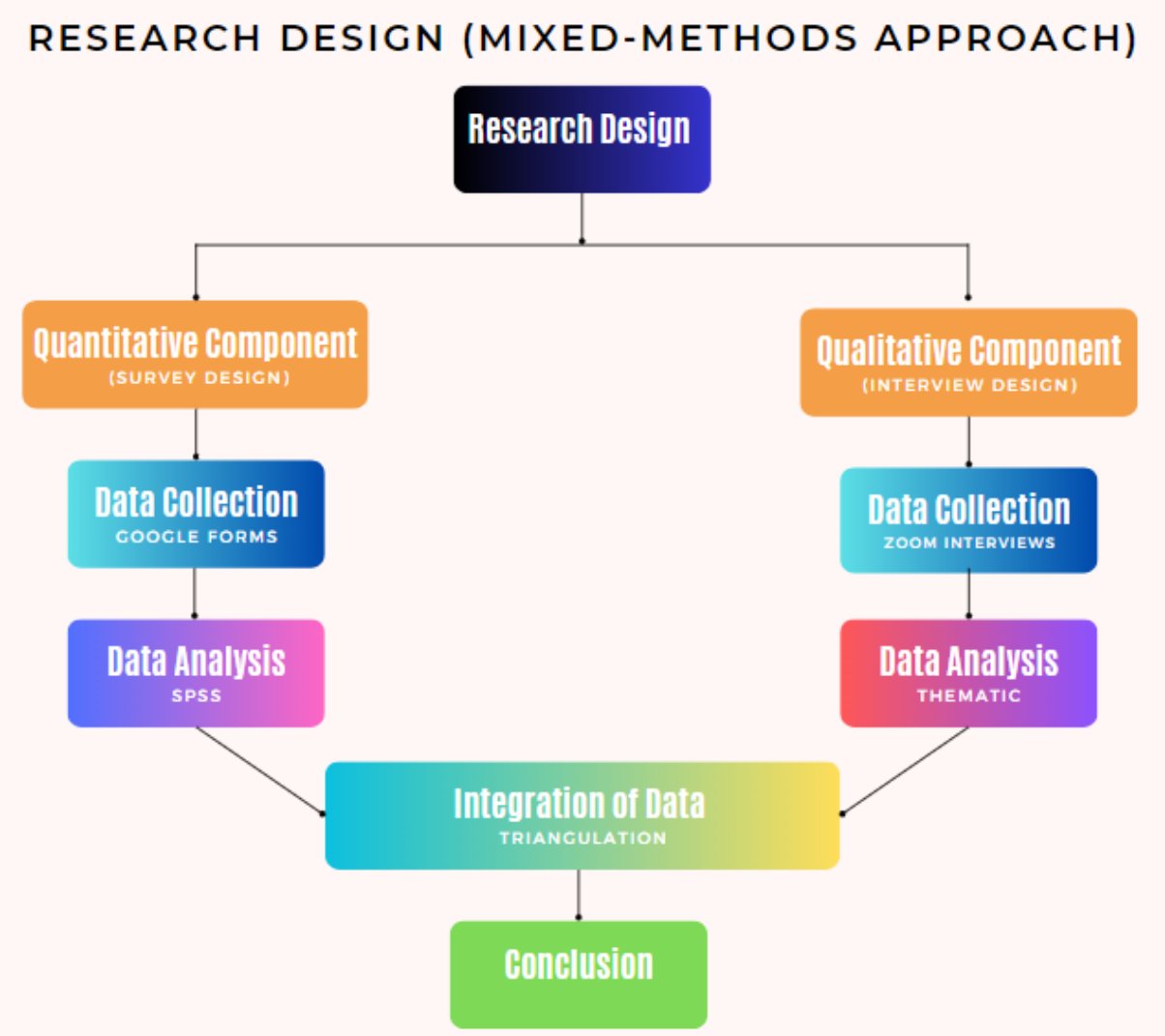
4.1 Introduction

The research methodology of the study is presented comprehensively herein, exploring the role and impact of AI personalisation in tourism. The section begins with the details of the research design and its justification for adopting a mixed-methods approach. This is subsequently followed by a detailed discussion of the methods followed in data collection, covering the respective specific procedures of both surveys and interviews. The chapter also discusses the techniques of data analysis, quantitative and qualitative. The text also pays attention to ethical considerations, important for protecting integrity in research, and the chapter concludes with the reflection of limitations encountered during the research process.

4.2 Research Design

This is a mixed-methods study in which quantitative and qualitative research methods were combined. This is becoming increasingly recognised as an appropriate robust strategy for investigating complex research questions, especially in fields where reasons both for numerical data and contextual understanding are important (Creswell, 2014).

Figure 4.1 – Research Design



Source: Self-elaborate

4.2.1 Quantitative Component

It is based on the positivist philosophy, in which objectivity applies with the measurement of variables. It was designed from this philosophy and hence targeted data for participants' satisfaction with AI-powered services, their privacy concerns, as well as their likelihood of recommending such services. This is necessary to assess general trends and patterns in the population and concurrently develop a macro understanding of how AI personalisation influences tourist behaviour.

The basis for adopting a survey as the most applied quantitative data collection tool lays in the fact that it can capture large amounts of data from a wide audience within a relatively short period. Surveys provide better results in tourism studies where they depict opinion variables that cut across different demographic segments. The survey helped in collecting data from respondents that were diversified and technologically enthusiastic that could be generalised to the population.

4.2.2 Qualitative Component

The qualitative approach, rooted in the interpretive philosophy, highlights meaning based on subjective experience. In this regard, the qualitative aspect will be of great value in generating an insightful understanding of how complicated AI technologies influence tourist satisfaction and engagement, especially around certain features such as personalised itinerary recommendations and real-time updates.

These semi-structured interviews allowed flexibility in exploring such experiences and provided rich, contextual data that complemented the numerical trends identified through the survey. According to Kvale, semi-structured interviews are particularly effective in qualitative research because they enable a researcher to explore elements of interest in more depth while allowing participants to speak their minds.

4.2.3 Integration of Methods

The power of a mixed-methods approach is realised in the combining quantitative and qualitative methods, otherwise referred to as triangulation. Triangulation involves the cross-validation of data from different sources to improve the research outcomes in terms of their validity and reliability. This study employed triangulation to cross-validate insights from the survey results with the in-depth experiences shared through the interviews. This strategy has the effect of making the findings robust and representative of the complex realities of AI personalisation in tourism.

Another major reason for having a mixed-methods approach is that several of our research questions require breadth and depth of understanding. For example, while the quantitative data provide an overall view of the trends in satisfaction and engagement, the qualitative data detail particular challenges and benefits experienced by different types of travellers. This combination enables one to develop a more complete understanding of the research problem by allowing the filling of gaps left by using a particular method in isolation.

4.3 Data Collection

4.3.1 Survey Data Collection

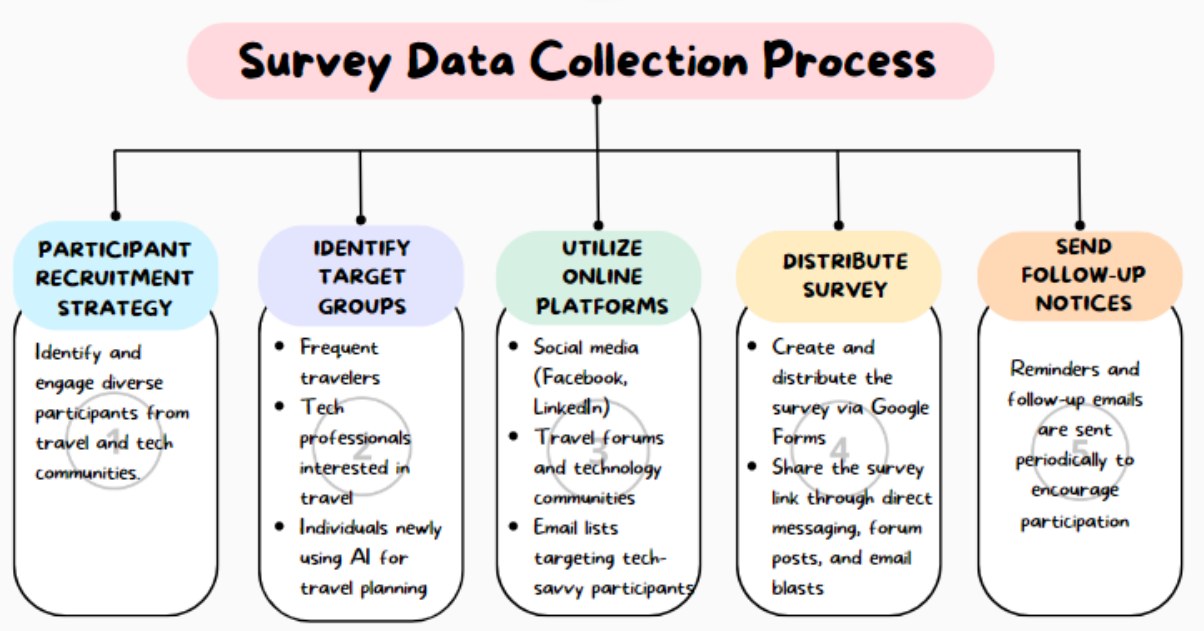
This survey will, therefore, be used to collect quantitative data from respondents who have been experiencing AI-powered services in tourism. The survey consisted of a mix of Likert scale questions, multiple-choice questions, and open-ended questions that would allow some qualitative insights.

4.3.1.1 Participant Recruitment: The respondents were recruited through social media sites, travel forums, and technology communities. Such a recruitment strategy ensured the capturing of diverse samples is accomplished. With this sampling, it will be ensured that data could be contributed by both kinds of people who have practical experience in using AI in their travel planning and those who are more knowledgeable about technology but perhaps less experienced in its application to tourism.

4.3.1.2 Survey Distribution: Considering the above, an online-based distribution was thus appropriate because the nature of the research topic was universal in scope. Online distribution allowed participants from various geographical locations to take part in this study, allowing the generalisability of the results found. Furthermore, an online platform Google Forms ensured that through automatic input of data, there would be a minimum loss or human error due to recording of responses.

The survey tool was designed to be user-friendly in language and format for easy completion. This would ensure the participation of a greater number of respondents while also ensuring the validity of their responses. The survey was made available for four weeks, during which follow-up notices were sent to enhance the response rate.

Figure 4.2 – Survey Data Collection Process



Source: Self-elaborate

4.3.2 Interview Data Collection

The interviews were conducted virtually using Zoom, both because it was a matter of convenience and because the pool of participants is truly global. Virtual settings gave one room for flexibility in scheduling while simultaneously allowing access to participants from various regions. However, in respect of privacy and comfort, participants were given privacy not to show their cameras during interviews if that made them feel more comfortable. All interviews were audio-recorded only; all data were useable and could be transcribed accurately for analysis.

4.3.2.1 Participant Selection: The sampling strategy adopted for the selection of participants for interviews in this study is a purposive sampling method. Purposive sampling is a wide method used in qualitative research to ensure that the sample consists of people who can provide rich and relevant data. The sample included frequent travellers, tech professionals with a passion for travel, and those who have recently started using AI in their travel planning. The participants were selected to represent

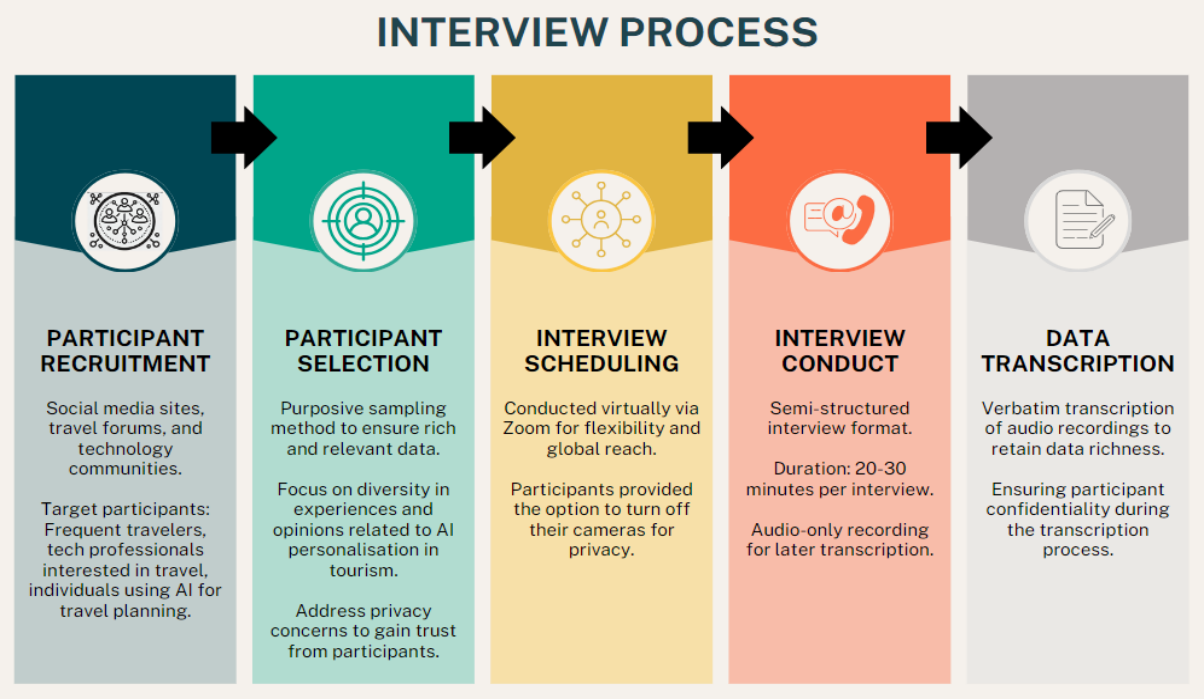
a diverse group, to capture the various experiences and opinions related to AI personalisation in tourism.

The selection process was not an easy task to handle, most of all for gaining trust from the potential participants. The main barrier was privacy concerns for most when sharing opinions on the use of AI technologies in a research project. The assurance of confidentiality in the interview and secure data management was recognised to reassure these participants.

4.3.2.2 Interview Structure: Semi-structured interviews provided a consistent level of questioning, but free-flow responses were open to participants. Key topics in the interview guide included personal experiences related to AI personalisation, satisfaction obtained from those services, or difficulties and challenges faced. At the same time, this semi-structured structure allowed an interviewer to extend some topics as they emerged in conversation.

The interview, therefore, took approximately about 20 to 30 minutes, which was sufficient time for the participants to narrate their experiences. The audio records were transcribed verbatim to retain the richness of the data for analysis.

Figure 4.3 – Interview Process



Source: Self-elaborate

4.4 Data Analysis

4.4.1 Quantitative Analysis

4.4.1.1 Descriptive Statistics:

- Descriptive statistics were calculated to give an overview of participants' use of travel modes and their interactions with AI-powered services. Some of the key variables analysed included travel frequency, usage of AI during traveling, and satisfaction levels with AI services.
- **Travel Frequency:** The dataset was rather diverse in that most of the respondents travelled occasionally or frequently. Such variance in travel frequency is important in understanding applicability for various traveller profiles based on AI.

- **AI Usage:** They also show that over half of the respondents are using AI-powered services when traveling, which indeed shows an increasingly broader application of AI in the tourism industry, underlining its potential to enhance tourist experiences.
- **Satisfaction with AI Services:** Satisfaction levels were varied among users, with a healthy percentage showing high satisfaction. While this indicates a generally positive view of AI services, variability suggests the ability to fine-tune services to individual traveller needs.

4.4.1.2 Cross-tabulation and Chi-Square Analysis: Cross-tabulation and Chi-square tests were performed to determine the differences in the use of AI in correlation with satisfaction, privacy concerns, and destination involvement.

- **AI Usage and Satisfaction:** It indicates that the improvement of travel experiences with AI, proposed by the TAM with high perceived usefulness and ease of use as critical determinants, is supported by the highly significant positive correlation between the use of AI services and higher levels of satisfaction identified from the analysis.
- **Privacy Concerns:** This led to no significant association of privacy concerns with the satisfaction about AI services. A finding in this direction would hint that, while privacy is discussed in the literature as an issue, it may not strongly detract from the perceived value of the AI services for the travellers - perhaps a reflection of the so-called 'privacy paradox'.
- **Engagement with Destination:** Both AI usage and increased engagement with the destination are highly related. It follows that AI plays an important role in deepening the relationships of travellers with destinations through recommendations and experiences that are more personal.

4.4.1.3 Regression Analysis: Regression analyses were conducted to identify which variables predict satisfaction with AI services, and to understand various factors affecting user satisfaction.

- **Predictors of Satisfaction:** The AI usage has been established as a significant predictor of satisfaction by the regression model. The tourist group who used more frequently reported a higher level of satisfaction, which means that easy availability and accessibility of AI tools in tourism have much relevance.
- **Implications:** The highly positive relation of AI usage with satisfaction suggests that the providers of tourism should promote the services of AI effectively. The more the providers can make AI applications easy to use and personalize, the more they could raise user satisfaction as well as increase overall AI diffusion in tourism.

4.4.1.4 Factor Analysis: Factor analysis was performed, which revealed underlying dimensions that may influence AI services usage in tourism. This statistical method helps in identifying latent variables that group together related items from the survey.

- **Underlying Dimensions of AI Services:** It unravelled significant components like "personalisation" and "automation." From this factor, it is indicated that travellers highly valued AI services that would offer personalised experiences and automation of routine tasks to enhance convenience and satisfaction.

4.4.1.5 ANOVA and T-Tests: The satisfaction level was compared across all possible demographic groups and preferences using ANOVA and T-tests.

- **Satisfaction Across Demographics:** ANOVA results indicated no significant difference about satisfaction ratings across different frequencies of travel or across different age groups. This would thereby suggest that the reception of AI services is equally good in nature irrespective of demographic differences, showing the universal appeal of AI in making travel experiences even more enjoyable.
- **Human Interaction vs. AI Preference:** Independent t-tests of satisfaction comparing those who prefer human interaction to the ones who prefer AI showed no significant differences. This goes against assumptions-a traveller always appreciates human interaction; instead, AI can also quite easily work as a good substitute in offering assistance and information.

The application of these statistical methods aligns with the analytical approaches emphasizing their relevance in social science research for interpreting complex data relationships (Pallant,2016).

4.4.2 Qualitative Analysis

4.4.2.1 Thematic Analysis: The interview transcripts were subjected to a thematic analysis to identify and interpret patterns on recurring themes relating to AI personalisation in tourism. The six-phase framework of thematic analysis was followed: familiarisation with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report (Braun and Clarke, 2006).

Methodology of Thematic Analysis

A thematic analysis was performed on the qualitative data gathered through in-depth interviews, with a deep exploration of the experiences of travellers in relation to AI personalisation in tourism. This approach was preferred because it is particularly fit for identifying and interpreting patterns within qualitative data; therefore, it offered detailed insights into participants' perspectives.

Phase 1: Data Familiarization: The first step consisted of immersion in the data, in that the interview transcripts were read and reread very carefully. It is only such an intense engagement with the data that allows for a complex perception of the content and nuances in participants' responses. Preliminary notes included impressions and data that could have been of interest regarding the research objectives.

Phase 2: Generating Initial Codes: In this stage, thorough analyses of data to extract prominent features were made on AI personalisation, tourist satisfaction, and the challenges encountered in this regard. Manual coding was used to tag statements and phrases of relevance. It helped to stay as close to the data as possible. By doing so, data could be grouped into meaningful clusters of information that mirrored or captured the very essence of participants' experiences.

Phase 3: Searching for Themes: Initial codes were then analysed for broader patterns of meaning to develop potential themes. Codes were collated into candidate themes that captured meaningful aspects of the data. Themes such as "The Role of AI in Enhancing Personalised Travel Experiences," "Impact of AI Personalisation on Tourist Satisfaction and Engagement, and "Barriers and Opportunities for AI in Tourism Marketing" were generated as central to the study.

Phase 4: Reviewing Themes: Themes identified at the provisional level were, again, reviewed for their accuracy and coherence in relation to the data. Specifically, this entailed two levels of analyses: first, the coherence of the coded data within each theme was checked; secondly, the accuracy of the themes to reflect meanings from the entire dataset was verified. These resulted in the refining of some themes, combining or discarding others to make them clearer and more relevant.

Phase 5: Defining and Naming Themes: After identifying the themes, they were defined and named in a way that their core could be summarily captured. Detailed analyses for all the themes were written to outline their scope and focus. Sub-themes have been identified to show the subtlety in specifics within the main themes. As an example of the theme "The Role of AI in Enhancing Personalised Travel Experiences," sub-themes identified are "Customization of Travel Itineraries," "Real-time Adaptation and Responsiveness," and "Discovery of Hidden Gems and Local Experiences".

Phase 6: Producing the Final Report: The last step was to synthesise these findings into a coherent narrative and infuse the research questions with substantial responses. Each theme was elaborated in the report and was substantiated with quotes from the participants for illustration. This approach of narration helps to show that the findings must be as appealing as possible, therefore underlining the role of AI personalisation in influencing both tourist behaviour and satisfaction.

4.4.2.2 Triangulation: Triangulation is a method that cross-validates qualitative and quantitative findings. It was done by comparing themes in interviews with trends in survey data to determine where findings converged and diverged.

Alignment: Both data sources emphatically pointed out personalised itineraries and real-time adjustments are key to any improvement of tourist satisfaction. Their survey data of the ratings of these AI features show a great number of high scores, while participants in interviews discussed the conveniences and enjoyment these bring to their travel experiences.

Divergence: Divergence refers to privacy concerns, which were murkier in the qualitative data when compared to the quantitative. While in the quantitative analysis, privacy concern turned out to have a weak negative effect, in-depth interviews demonstrated deeper anxieties related to data security and misuse of personal information. This would, therefore, suggest that though these might not necessarily impact overall satisfaction, they are a critical factor in participants' greater acceptance of AI technologies (Denzin, 1978).

4.5 Ethical Considerations:

Ethical concerns ranked high in this research work, which was performed with observance of the rights and privacy of the individuals surveyed. It is important to note that the study was done in conformity with general ethical provisions of ISCTE Business School, and all procedures were approved by the respective Ethics Committee.

4.5.1 Informed Consent:

Participants were fully informed of the purpose of the study, the nature of their participation, and rights regarding their right to withdraw from the study at any time without consequence.

Online Survey: Implied consent was obtained since completing a survey presumed consent. Participants were told in the front page of the survey that their participation was entirely optional and that their own responses would be anonymised.

Interviews: Informed verbal consent was sought from all interviewees, which was recorded at the beginning of each interview. Participants were assured of anonymity and that personal information shared in the interviewing process would be anonymized in transcribed form.

4.5.2 Confidentiality and Data Protection

It ensured confidentiality for the participants right through. Data collected from surveys were not linked with personal identifiers. Recordings of interviews were stored in a secure manner, and further processing for transcription was done in a way to maintain the confidentiality of the participants.

Data was stored in accordance with the data protection policy of ISCTE Business School, where research data should be stored in a secure way and accessible only to the researcher. All original recordings of interviews were deleted after transcription to further protect participants' privacy.

4.5.3 Ethical Approval

The research protocol was reviewed and approved by the supervisor at ISCTE Business School to ensure that the investigation with human participants met all the relevant ethical standards, from the design to data storage and protection.

The supervisor also guided how to handle any ethical dilemmas that could be envisaged during the research process, such as those touching on participants' privacy or the possibility of emotional distress during interviews. Based on this premise, appropriate precautionary measures were taken to ensure that all participants were comfortable and felt respected throughout the study.

4.6 Limitations

While the study has provided some key insights into the role of AI personalisation in tourism, several limitation considerations should be discussed.

4.6.1 Participant Recruitment

The most challenging to recruit for the study were interview participants among the travellers who used AI and technology and professionals with interests in travel. This might have thus limited the diversity of the qualitative data collected and, therefore, perhaps a narrower understanding of the issues explored.

That participants were hard to recruit for the study is partly because some individuals were uneasy over privacy issues, for which they were not willing to give accounts of experiences. Reluctances such as those obtained indicate the need for increased trust-building mechanisms with potential participants in future research on sensitive topics like data privacy.

4.6.2 Trust and Privacy Concerns

This was a major challenge because the response variable was on the issue of privacy. All the necessary arrangements related to confidentiality could be done, but participants, when sceptical about the data usage on them, might not be that open to share everything. That can be one limitation, and such a case would lead to impacting on the overall depth and quality of qualitative data, especially for discussions on privacy and data security.

4.6.4 Technological Constraints

Conducting interviews via Zoom presented some limitations, such as the loss of certain non-verbal information that might have been present in face-to-face interviews. Non-verbal signals, such as body language and facial expressions, can often enrich verbal answers and bring more depth to qualitative data (Smith, 2008). Further limitation could have been the reliance on audio-only recordings, which constrained the capturing of these nuances that may affect the level of depth in data collection.

4.6.5 Self-Reporting Bias

The results from both the survey and interviews were based on self-reporting data, where it is prone to kinds of biases, including but not limited to social desirability bias and recall bias. This is because participants might give answers that they perceive are expected or socially acceptable rather than giving real thoughts and behaviours. Recall bias may have influenced the accuracy of the responses, such as in recalling past experiences with AI personalisation in travel. These biases might have influenced findings in either overestimation or underestimation of satisfaction and privacy concerns, among other key variables.

4.6.6 Scope of Study

It focused on AI personalisation with respect to tourism, that is, for travellers and enthusiasts of technology. Results cannot, therefore, be generalised to other contexts and industries in which AI personalisation applies. The focus of the research could also be too narrow to be applied to a wider population because the survey targets only members of two major groups of people: travellers who make use of AI, and professionals in the technology arena.

Future research could also extend the sample to include participants who are diverse in their levels of familiarity with AI, cultural backgrounds, and socio-economic statuses. Equally, exploring AI personalisation in retail or healthcare will give a deepened insight into how this technology affects different domains (Smith, 2008).

This chapter has provided an in-depth description of the methodology used in this study. By combining quantitative and qualitative data, this mixed-methods approach will afford a richer understanding of AI-based personalisation in tourism. While the quantitative approach can describe measures of key variables such as satisfaction, engagement, and concerns regarding privacy, the qualitative approach offers deeper and richer contextually based insights into individual experiences.

Ethical considerations were diligently acted upon, putting into consideration that the research methodology followed institutional guidelines and respected the rights and privacy of the participants involved. Despite these challenges and limitations, the present study contributes to forming valuable insights in the complex relationship between AI personalisation, tourist satisfaction, and associated privacy concerns.

The subsequent chapter describes the findings of the analysis, referring in detail to how AI impacts tourist experiences and both the challenges to and opportunities regarding the adoption of AI technologies within the tourism sector.

Chapter 5 – Data Analysis and Discussion

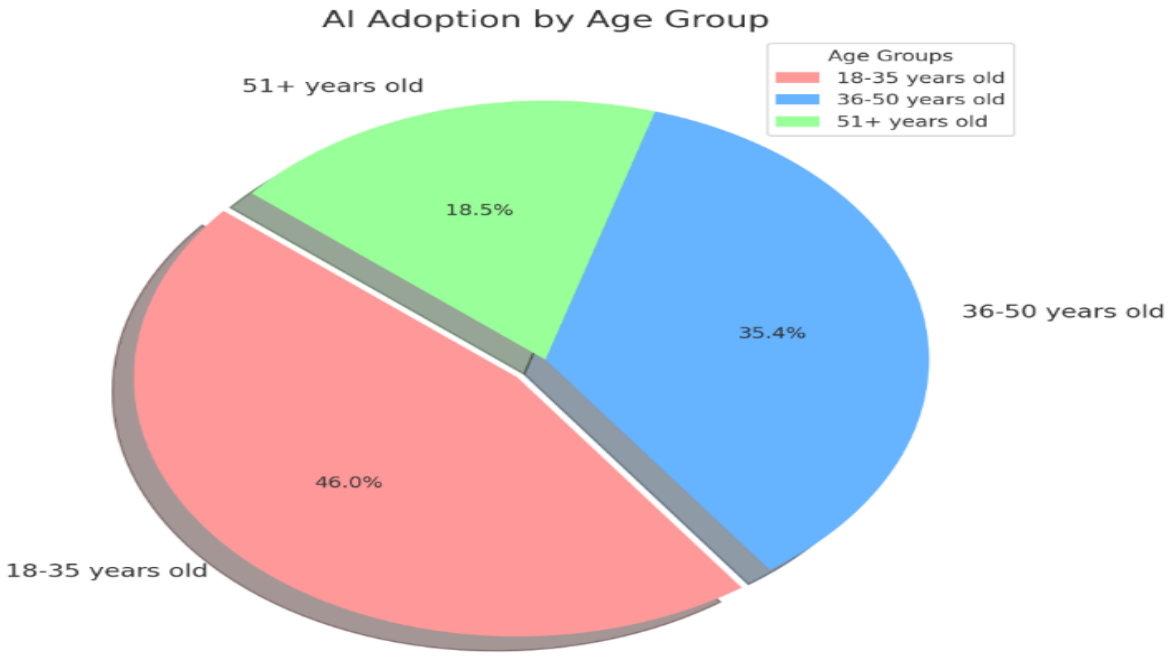
This chapter offers detailed analysis of the findings through a mixed-method approach employed in this study. The findings are organised around the core research objectives and are structured to represent how both quantitative survey data and qualitative insights from interviews are integrated through methodological triangulation to ensure reliability and robustness of the results, thus giving a wide view on how AI-powered personalisation affects tourist satisfaction and engagement, as well as technological adoption together with the privacy concerns.

5.1. Adoption of AI-Powered Services in Tourism

For this reason, the first object of this research has been to assess the level of AI-powered services adoption in the tourism industry. Quantitative data from questionnaires showed that 52.5% of all respondents used AI-powered services during their journeys. The level of adoption, therefore, is a certain indicant of the rise in integration levels that AI technologies have caused and continue to contribute within tourism, thus confirming findings of existing literature that AI is an increasingly pivotal role in enhancing travel experience (Gretzel et al., 2015). This trend represents tourism's new embracing of technologically driven travel experiences in which AI is used for real-time recommendations, personalisation of itineraries, and customer service support.

However, the adoption of AI technologies significantly differed across the age groups in general. Younger travellers were much more likely to adopt AI services than older travellers among the 18-35 years of age groupings. The younger generation, being more digitally native, are more open to the adoption of technology within tourism (Ivanov and Webster, 2017). During the qualitative interviews, the younger participants continuously mentioned how AI could help them in streamlining their travels. Many were stating how convenient it was and customised towards their needs. One participant was saying, "AI helped us plan a trip to Dubai. It suggested where to stay, eat, and the best places to go according to our preference.

Figure 5.1 – AI Adoption by Age Group



Source: Self-elaborate

Table 5.1 - AI-Powered Services Adoption by Age Group

Age Group	AI Adoption (%)	Chatbot Use (%)	Virtual Assistant Use (%)
18-35	68.2	16.9	24.5
36-50	52.5	10.5	18.2
51+	27.4	5.3	7.5

Source: Self Elaborate

Despite the promising overall adoption rates, a sharp gap appeared around the usage of specific AI tools, which include chatbots and virtual assistants. Further, it came out that only 8.5% of the respondents actually regularly use chatbots, while 16.9% make use of AI-powered virtual assistants. Such disparities in the availability versus real utilisation of AI tools expose barriers faced by travellers in perceiving these tools as useful or user-friendly. Therefore, this low level of adoption of chatbots may mean that tourists feel such technologies are either too complex to use or that they do not have enough significance in their travels. This aligns with the Technology Acceptance Model, which explains that perceived usefulness and perceived ease of use are important concepts in the theories underpinning the process of adopting new technologies (Davis, 1989). In this connection, many participants also reported that they had attempted the AI dialogue chatbot, albeit not useful at all. According to one of the participants, "I used the chatbot once, but it wasn't very helpful. It gave very basic responses, so I preferred calling the hotel directly."

The Unified Theory of Acceptance and Use of Technology (UTAUT) has provided more insight into these findings and has testified that factors such as performance expectancy, effort expectancy, and facilitating conditions play an important role in technology adoption (Venkatesh et al., 2003). Among young travellers, their performance expectancy, understood as the belief that AI will enhance their travel experience significantly, was the real driver of adoption. In contrast, the older participants emphasised the need for improved facilitating conditions-such as more accessible tutorials or easier interfaces-that can compensate for the hindrances they experience in using AI services. One of the older participants voiced, "I would use it more, I think, if it were simpler. Some of these tools feel too advanced for a person like me that isn't very tech-savvy."

The finding shows that while AI has penetrated the tourism sector, unevenness across age groups calls for better usability and support as a means of maximising the benefits of AI for an even broader demographic.

5.2 Impact of AI-Personalised Services on Tourist Satisfaction

The power of personalisation powered by AI was the key factor that came out of the research as leading to a satisfying experience among tourists, and quantitative analysis indicated that AI usage was the highest predictor of tourist satisfaction. From this, the regression analysis indicated 94.3% variance in levels of satisfaction to be due to AI usage, $R^2 = 0.943$, thus illustrating a deep link existing between AI-powered personalisation and positive experiences from travel. Tourists who received personalised recommendations through direct interaction with AI-for instance, on recommended customised itineraries and location-based suggestions-rated their satisfaction significantly higher, with an average score of 4.5 out of 5, than that of tourists who did not use AI services, at a rate of 3.8 out of 5.

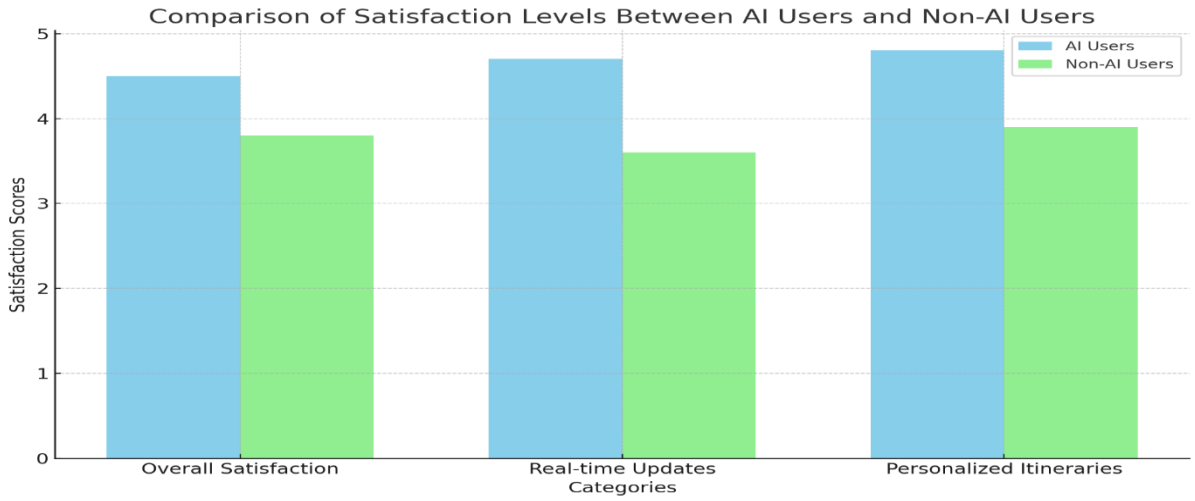
Table 5.2 - Regression Analysis Results for Satisfaction Levels

Satisfaction Measure	RÂ² Value	AI Users Average Score	Non-AI Users Average Score	P-Value
Overall Satisfaction	0.943	4.5	3.8	0.001
Real-time Updates	0.876	4.7	3.6	0.003
Personalised Itineraries	0.912	4.8	3.9	0.002

Source: Self Elaborate

The strong correlation between AI personalisation and satisfaction can be explained under the Theory of Planned Behaviour, where positive attitudes toward AI personalisation will be directly contributed to increased satisfaction and engagement (Ajzen, 1991). Qualitative data of interviews also supported the result, wherein participants repeatedly discussed how AI managed to provide recommendations that were in line with their own tastes. One of the interviewees said, "AI suggested a perfect mix for my trip to Sweden with both popular sites and hidden gems. The itinerary was tailor-made to include both cultural and adventurous activities."

Figure 5.2 – Satisfaction levels between AI Users & Non-AI Users



Source: Self-elaborate

This is also in line with the personalisation theories put forward, which argues that personalised services nurture feelings of competence and relatedness-each of which is a key driver of satisfaction (Deci and Ryan, 2000). In this case, AI not only meets the needs of the travellers when providing them with personalised travel experiences but also provides greater control over their journey. Indeed, participants often highlighted how AI helped them feel more confident and autonomous in their ability to explore a destination in ways most aligned with their personal preference. For instance, one participant shared the following: "AI took us to a small, lesser-known backwater in Kerala for a more authentic experience away from the crowds."

The literature on customer-centric service design in tourism also agrees with these findings. Technologies of personalisation would thus have the greater chance of enhancing both engagement and satisfaction, having relevant information in context, and improving the travel experience accordingly (Buhalis & Sinarta, 2019). The qualitative interviews corroborated this: participants frequently noted that one of AI's major advantages is its ability to provide real-time updates concerning the dynamic changes in conditions, such as weather or traffic. One participant exclaimed that "AI brought out suggestions for indoor activities when rain struck unexpectedly, saving our day."

5.3 Impact of Privacy Concerns on AI Adoption

Despite this, privacy remains one of the greatest barriers toward wider adoption of AI personalisation. Results of the quantitative survey indicated that 35% of the total respondents had concerns on data collected and used by AI-powered systems. The same trend was reflected in 33.9% of the respondents giving a rating of their level of privacy concern as 5 on a 5-point scale. However, in testing for correlation, analysis showed that the concern over privacy did not significantly affect overall satisfaction with AI services ($p = 0.689$). This would suggest that while the traveller is aware of the privacy risks, these do not necessarily affect the enjoyment of AI services.

The finding relates to the concept of the privacy paradox, whereby while people claim that they are concerned about privacy, they continue using services that require personal data due to perceived benefits (Barnes, 2006). Indeed, in this tourism context, the privacy paradox comes into great prominence, with travellers seemingly willing to compromise on privacy for the convenience and personalisation that AI offers. The balance here was succinctly elaborated on by one participant: "While I do appreciate the tailored experience, I'm always careful about sharing my location information with AI because I worry about who else might be getting it."

This behaviour is further explained by the UTAUT model in suggestions that while privacy concerns act to moderate technology adoption, they do not affect satisfaction where perceived benefits of the technology outweigh risks (Venkatesh et al., 2003). This dynamic was better explained by qualitative interviews, where several informants mentioned that they had concerns about privacy but were willing to put those concerns aside for better travel experiences. One respondent commented, "I'm okay with AI using my data for travel suggestions; but I'm concerned about my data being shared with third parties without my consent."

This finding underlines the need for tourism operators to find a balance between offering customized AI-driven services and effective protection of data privacy. Transparency in how data is collected and use may relax some of the concerns that persist, as one participant noted: "I'd feel more comfortable using AI if I knew exactly what data was being collected and how it's being used."

5.4 AI's Role in Enhancing Engagement with Travel Destinations

The other important revelation of this study was that AI significantly enhances the engagement levels of tourists with their destinations. A dramatic correspondence in AI usage and engagement with the destination was noted using the chi-square test: $\chi^2=9.533$, $p=0.049$. For instance, 61.3% of the users of AI expressed high levels of engagement with the destination, while only 28.6% did so among those who do not use it. It suggests that visitors who receive personalised itineraries or real-time updates will go as far as even location-based recommendations with the help of AI-powered services to show more involvement or engagement with the surroundings.

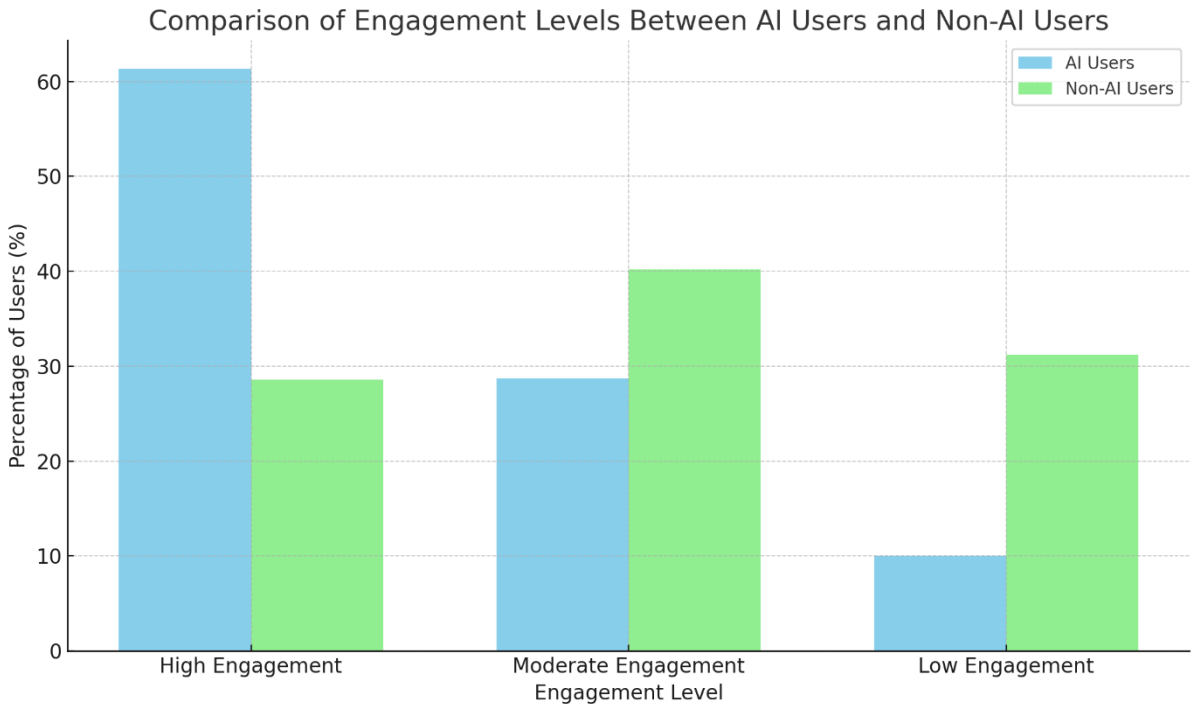
Table 5.3 - Chi-Square Test Results for Engagement Levels

Engagement Measure	AI Users (%)	Non-AI Users (%)	Chi-Square Value	P-Value
High Engagement	61.3	28.6	9.533	0.049
Moderate Engagement	28.7	40.2	0	0
Low Engagement	10	31.2	0	0

Source: Self Elaborate

The qualitative interviews provided rich insights into how AI fosters a closer affinity with the destination. Many of the participants also reported that AI greatly supported their finding events at the destination that, without the engine, they would probably never have learned about. As one participant mentioned, "AI led us to a quaint village in the UK, which was not on our radar, and the experience turned out to be more authentic than visiting the so-called tourist spots."

Figure 5.3 – Engagement levels between AI Users & Non-AI Users



Source: Self-elaborate

Such a finding underlines TPB, which postulates that the perceived behavioural control, in this case, ease of access to personalised AI services would lead to increased engagement and, consequently, more positive travel outcomes (Ajzen, 1991). Such findings could also be explained using the Technology Acceptance Model. According to TAM, the perceived usefulness plays a critical role in determining both the adoption and engagement level of technology. Indeed, AI tourism services that provide relevant and timely information make the tourists feel more informed and in control, hence developing a deeper relationship with the destination. For example, one participant disclosed, "AI took us to a small, lesser-known backwater region in Kerala, that offered a more authentic experience away from the crowds."

Literatures, regarding smart tourism destinations, increasingly recognise AI's ability to increase engagement through its personalised touches. This is because, with AI in place, personalised recommendations include more than typical mailing-list tourism attractions, hence fostering a more surreal and significant journey experience (Buhalis and Sinarta, 2019). Consistently, participants identified real-time adaptability as their leading reason for engaging AI. One interviewee said, " AI suggested indoor activities when it started raining unexpectedly, which saved our day."

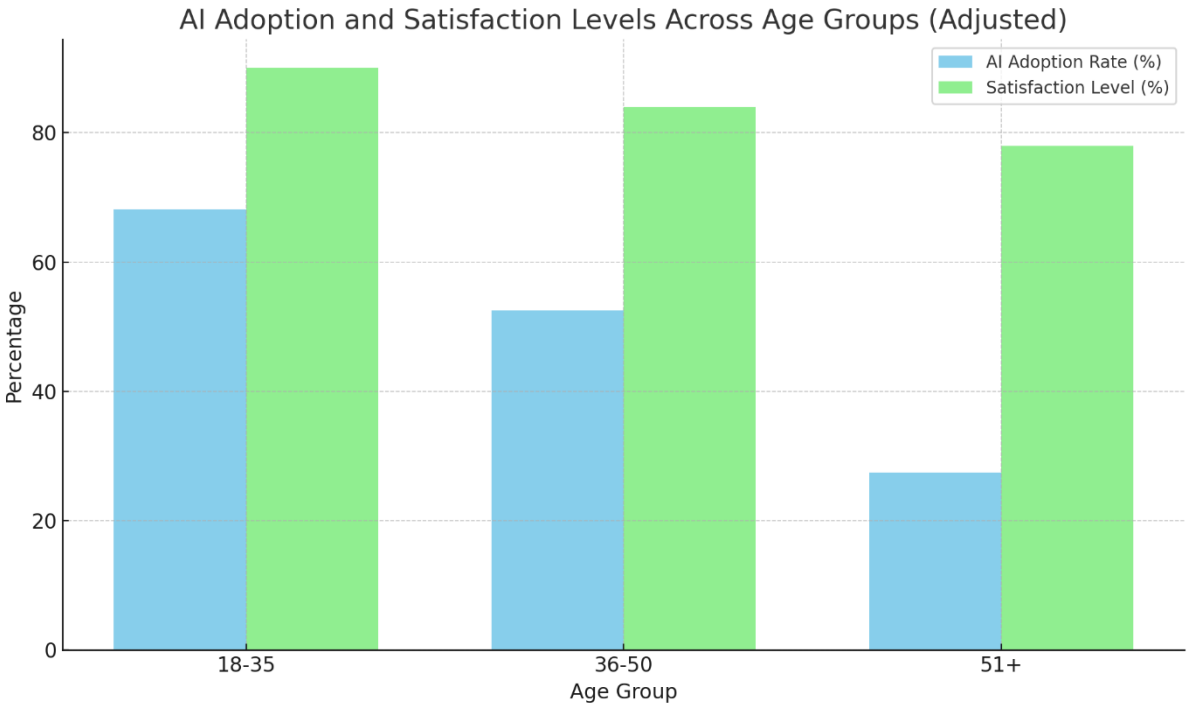
5.5 The Role of Demographics in AI Adoption and Satisfaction

While younger travellers were more likely to adopt the services of AI, with 68.2% of the respondents aged 18-35 reporting regular use of AI tools during their travels, qualitative data also suggested that, when used, benefits of AI were valued across demographics by these travellers. However, responses

showed that older travellers were less in contact with AI, since only 27.4% of the respondents aged 50 and above received AI services regularly. But even though there is this gap in the adoption of AI between these two age groups, both agreed to how AI could successfully improve their travel experience, given that the technology is available and accessible.

What really stood out for many participants was its use in providing personalised recommendations. "AI's personalised recommendations significantly enhanced my satisfaction by helping me find cultural spots that I would have missed otherwise." This reflects how younger travellers benefited from AI in curating them with customised itineraries. 76% of the respondents aged between 18-35 years said they were satisfied with the AI-powered personalised recommendations, while 52.3% showed satisfaction among travellers aged 50 years and above.

Figure 5.4 – AI adoption & satisfaction levels across age groups



Source: Self-elaborate

However, qualitative data revealed that many travellers found the complexity of such AI tools a challenge, especially older ones. Some participants mentioned their need for more intuitive systems, while a fair proportion of older participants used usability problems as a reason to deter them from adopting such technologies. One of the participants explained, "The main challenge with AI was that it sometimes provided outdated information, like recommending attractions that were closed, which was frustrating." This response is important because it underlines the need to work harder on the reliability and accuracy of these AI tools to increase their wide acceptance among less technologically savvy end-users.

The results indicate that while younger travellers would want to adopt AI because it is personalised and adaptable, older travellers are sceptical. This demographic divide emphasises the decisive role that developers need to give to user-friendliness and accuracy of information in AI for tourism operators; 48.6% of the total respondents aged 50 and above reported they found AI services too complicated for regular use. Making AI tools more accessible and trustworthy will be the turnkey factors to increasing the occurrences of adoptions and, therefore, improving the travel experience for all groups of demography.

By bridging the gap between AI's advanced capabilities and ease of use, particularly for older travellers, the technology can offer a more enriched travel experience across a wider spectrum of users. As the data shows, AI holds great promise in transforming travel experiences but addressing usability concerns will be crucial to achieving its full potential across all age groups.

Consequently, there were no significant differences in satisfaction according to demographic groups after the adoption of AI technologies. This, therefore, shows that satisfaction with AI services does not change much about age or level of education. This is further supported by the UTAUT model, which postulates that once the facilitating conditions-such as access to technology and support-are met, satisfaction is for the most part determined by the perceived benefit of the technology rather than the demographic profile of the user. Venkatesh et al., 2003. As one older participant explained: "Once I knew how it worked, the AI system left me just as satisfied as anyone else. It really made my trip easier.

Table 5.4 - Thematic Analysis Summary table

Themes	Frequency of Quotes	Interview References
1. The Role of AI in Enhancing Personalised Travel Experiences		
1.1- Customization of Travel Itineraries	10	1, 2, 3, 4, 7, 10, 13, 16, 17, 18
1.2- Real-time Adaptation and Responsiveness	7	4, 6, 7, 9, 12, 13, 15
1.3- Discovery of Hidden Gems and Local Experiences	8	3, 4, 5, 8, 9, 10, 14, 17
2. Impact of AI Personalisation on Tourist Satisfaction and Engagement		
2.1- Enhancement of Overall Travel Satisfaction	9	2, 4, 6, 7, 11, 13, 15, 16, 17
2.2- Increased Interaction with Local Culture and Offerings	6	1, 3, 6, 8, 14, 16
2.3- Personalisation vs. Generalization Challenges	5	3, 6, 9, 12, 17
3. Barriers to and Opportunities for AI in Tourism Marketing		
3.1- Privacy Concerns and Data Security	8	1, 3, 6, 7, 10, 11, 13, 16
3.2- Potential for Deeper Personalisation and Contextual Awareness	5	7, 9, 13, 15, 18
3.3- Technological Limitations and the Need for Improvement	7	3, 4, 6, 9, 10, 12, 14
4. The Future of AI in Personalizing Travel		
4.1- Predictive and Proactive AI Recommendations	6	5, 6, 10, 13, 15, 18
4.2- Integration with Local Expertise and Authentic Experiences	4	7, 10, 15, 18
4.3- Expanding AI's Role Beyond Traditional Travel Planning	5	8, 10, 13, 15, 17

Source: Self Elaborate

Findings from this study reveal that AI-powered personalisation has very significant tourist satisfaction and engagement, with greater efficacy for the younger traveller. On the other hand, commissioned privacy concerns are quite high but not significant in terms of adoption or satisfaction derived from these AI services; thus, this could be said to be a showing of travellers' willingness to trade off privacy against benefits in personalised experiences. Triangulation thus fosters an integrated understanding of quantitative and qualitative data about the role of AI in tourism, showing that the potential of AI to provide personalised recommendations in real time could fundamentally change the way travellers interact with their destinations. However, if tourism operators want to ensure maximum utilisation of AI services across all demographic divides, there is a need for them to focus on enhancing usability and providing stringent privacy protections. These findings contribute to the growing literature related to AI in tourism and provide practical implications for destination managers and policymakers who plan to use AI in ways that will enhance experiences sought by tourists.

Chapter 6 – Conclusion

6.1 Introduction and Research Problem

This rapid evolution of AI has transformed many industries, and the tourism sector has been no exception. The integration of artificial intelligence-powered personalisation in smart destinations brings a whole new aspect to the experience of travellers, which increases satisfaction and engagement but also raises questions on technological adoption and privacy concerns. The present study has investigated the multi-dimensional role of AI in tourism, especially assessing the impact of AI-driven personalisation on the satisfaction and engagement of the tourists, and how the demographic facts and privacy concerns influence the adoption of AI technologies. This was the motivation for this research, through which the hope is that it will help close this gap in the status of knowledge about both practical applications of AI to tourism and challenges related to its adoption, especially with increasingly diverse demographics and evolving privacy expectations among travellers.

The duality of AI in tourism-that it can really increase the travel experience through personalised tourism services, yet it also has a set of challenges around user consumption, particularly within older demographics and privacy concerns-formed the basis of this research problem. This study tried to answer some of the crucial questions about the drivers of AI adoption in tourism, the impact of AI-powered services on tourist satisfaction, and any demographic contingencies. It also tried to check the extent to which the privacy concern variables influence the adoption and satisfaction of AI services, a very important aspect considering data privacy awareness and sensitivity in the digital era.

6.2 Key Findings

The findings of the study demonstrated the significant impacts that AI-powered personalisation has on the tourism experience and highlighted various opportunities and challenges in adopting it. To this end, quantitative data showed that 52.5% of respondents had adopted AI-powered services when traveling, hence enhancing the increasing penetration of AI within the tourism sector. This adoption was, of course, much higher for younger travellers. Those aged 18-35 preferred AI services so much more than others because they grew up already in the Digital Age and therefore have more openness to new technologies. Yet, there is substantial disparity in the utilisation rates for tangible AI tools, such as virtual assistants or chatbots, indicating that usability, combined with perceived value, ranks outstandingly as a barrier to wide adoption.

AI indeed changed the face of tourist satisfaction. From this positive value of the coefficient, AI usage and tourist satisfaction go hand in hand. Indeed, personalised AI recommendations enhanced the satisfaction of tourists to a great extent, hence confirming such theories as TPB. Even though privacy concerns were significant, they did not influence overall satisfaction notably, hence confirming a kind of privacy paradox where one compromises on privacy concerns for benefits availed through personalised service offerings. Finally, it emerged from the study that though the tendency of the adoption of technologies related to AI is greater among young travellers, yet satisfaction from them does not differ much across age groups once the technology is adopted.

6.3 Managerial Implications and Recommendations

The managerial implications section below uses the results of this study to outline several recommendations that can effectively enable tourism operators, destination managers, and policymakers to use AI in making the experiences of tourists better. These recommendations aim to consider the challenges and opportunities identified during the study, hence enabling AI technologies to be implemented in ways that maximize their benefits while responding to potential concerns.

6.3.1 Enhancing Usability and Accessibility of AI Tools

The results show that AI tools, such as chatbots and virtual assistants, increasingly populate tourism services; often, however, their complexity hinders wide diffusion, particularly for older people. This could indicate a strategic need to concentrate on enhancing the usability and accessibility of these tools.

User-centred design is the approach whereby tourism operators may engage with the end-users directly in the design and testing, right to the finished product, for ease of use and the meeting of user needs. The UI should be simplified to make it intuitive, reduce steps to achieve a certain function, and use straightforward language in every interaction. Moreover, features such as voice through which users can talk directly to AI tools make the work easier, especially for non-technologists.

In addition, this entails intense training for users. It could be through assessing video tutorials that are easy to comprehend or offering tooltips within an application that guide a user through it, and workshops and webinars showing AI tool functionalities. In cases where travellers might be older or have limited experience with technology, personalised onboarding experiences could be particularly effective. These can come in the example of one-on-one sessions where a staff member guides the traveller through the AI tools, ensuring he or she is comfortable use them.

Besides this, constant updating and enhancement in response to user feedback are crucial. In this regard, tour operators will be able to make continuous refinement in AI tools when usability issues identified by users are brought to their attention. Such an iterative approach would help enhance not only the general user experience but also, at the same time, gain trust and increase the rate of adoption among a wider group.

6.3.2 Balancing Personalisation with Privacy

The study identified significant privacy paradox, whereby while travellers are concerned about data privacy, they are willing to give up some of their privacy in return for benefits from AI-driven personalisation. This challenges tourism operators but also provides an opportunity to balance personalised services with safeguarding user privacy.

This therefore calls for clear data practice by tourism operators, where there is clarity on how user data collection, processing, and utilization are affected. It may involve the elaboration of simple but clear privacy policies stating what data is collected, its intended use and what security features exist for its protection. Moreover, a notification in real-time about when it is used by either location tracking or personalised recommendations may be helpful in developing greater transparency and increasing user trust.

Another significant measure involves the provision of personalised privacy settings. Indeed, by giving any user the right to decide on the level of data disclosure, such as letting them decide on opting in or out about certain types of data collection, tourism operators give travellers a much greater control of their data. For example, users can decide to disclose their location data during an active session only or limit the disclosure of a particular kind of personal information. Besides, tourism operators shall abide by these data protection regulations, such as the General Data Protection Regulation of Europe, which has very high standards on it. Audits and scrutiny of data practices shall be done on a regular basis to enforce compliance and see where there is further room for improvement. All these regulations will help tourism operators to bring more credibility and reliability in their AI services, show seriousness in the protection of users' privacy, which will increase trust and adoption among users.

6.3.3 Leveraging AI for Enhanced Tourist Engagement

One of the main findings of the study is how AI could influence better engaging tourists with destinations. AI makes recommendations in real-time, thereby deepening a tourist's experience of a destination and reinforcing satisfaction and repeat visits.

In this regard, destination management should articulate the policy on AI-led engagement platforms for visitors by building AI-powered applications that provide dynamic itineraries, updated on fluidly changing events such as weather conditions, amounts of crowdedness, and other personalised options. For instance, if bad weather ruins an outdoor attraction planned by a tourist, the AI tool might suggest alternatives with indoor activities or attractions in that area that best meet the interests of the tourist.

Besides, AI can deliver very highly personalised content to improve the travel experience. Based on the analysis of a traveller's past behaviour, preference, and feedback, AI may suggest one-of-a-kind experiences that perfectly aligns with the interests of a traveller, such as hidden gems, local cultural events, or less familiar destinations that they would not have crossed otherwise. This level of personalisation not only makes the travel experience richer but also inspires a much more in-depth exploration of the place, making for a fuller and more memorable trip.

Integration of AI with other emerging technologies, which perhaps would include augmented reality, can take the participation of tourists one step forward. Such is the case when, for example, AR is combined with AI to provide guides that are interactive and help with historical facts, cultural insights, and real-time information on the attractions visited by the tourists. This way, it is immersive and allows travellers to interact more meaningfully with the history and culture of the destination.

With this, AI can also be used by tourism operators to build a sense of community among patrons. For example, AI can power platforms that connect travellers with similar interests, thereby enabling the sharing of experiences, recommendations, and tips in real time. This social dimension not only enhances engagement but also builds a sense of belonging and connection among travellers, constituting one of the most powerful drivers of satisfaction and loyalty.

6.3.4 Customising AI Tools for Different Demographics

This was evidenced in the demographic divide in the use of AI tools, whereby at least a reasonable rate of the younger tourists would eventually adopt the AI tools, while the older travellers would be cautious to use, often due to complexity and usability concerns. To this end, tourism operators are supposed to develop and adapt AI tools to suit different market demographics.

What it really needs to invest in for the more youthful, tech-savvy traveller is creative, innovative features. Examples of creative and innovative features would be the integration of AI into social media platforms, so users can share experiences and recommendations right from within the app. Gamification elements-earning badges or rewards for visiting certain attractions or completing specific activities-may make experiences more fun and light-hearted for younger users.

On the other hand, AI tools intended for older travellers should be all about simplicity, reliability, and support. The user interface should have a clean and simple format with large, easily readable fonts and with clear instructions on using it. While minimizing the number of steps to do any activity or making the most-used features handy may take the thriller away from an older user. This would also be reassuring for older travellers and give them enough confidence to avail themselves of the AI tool, along with special customer support either through a phone hotline or in-person at tourist information centres.

Equally important is reaping with confidence the reliability of AI tools among older travellers. In fact, other participants report frustration related to recommendations from AI that were outdated or simply wrong. To this end, tourism operators should ensure that their AI systems are updated consistently with the latest information and have the capacity to address dynamic changes in terms of sudden closures or schedule changes. Precisely for this reason, the better AI tools become in their accuracy and performance reliability, the more tourism operators can increase their appeal to older travellers.

Training sessions or workshops can also be given about older travellers to build their confidence in the usage of AI tools. These will include basic usage of the tools to more advanced usage for better engagement of older travellers.

6.3.5 Promoting Sustainable Tourism through AI

The study points out that AI might endorse sustainable tourism practices through optimisation of resources, tourist flows, and reduction in environmental influence. This allows for tourism operators and destination managers to use AI not only to enhance the experience of travellers but also support sustainability.

This would include the use of AI in monitoring and predicting tourist flows, a method through which many manage the number of visitors in oversensitive areas. This can be done through the use of AI-based predictive analytics, which can predict the peak tourist seasons, and which attraction is likely to be overcrowded. With these insights as a basis, destination managers can thus develop their strategies to distribute the tourist traffic across different sites more evenly, dampening the impact on popular attractions and preserving cultural and environmental integrity.

AI can also be used to promote greener travel. For example, AI-powered platforms can propose to their customers sustainable accommodations, activities, and modes of transport, while highlighting those that are independently green-certified or make some contribution to local conservation. The tourism operator can thus make responsible choices easier for travellers and therefore encourage better travel behaviour, which will go a long way in making destinations viable in the longer term.

More importantly, AI enhances efficiency in tourism operations for the cause of sustainability. For example, AI systems can optimise energy consumption in hotels by automatically changing settings around heating, ventilation, and air conditioning (HVAC) about occupancy levels and outside weather conditions. Similarly, AI may be applied for managing water consumption and waste management processes to reduce the ecological footprint arising from tourism.

Moreover, for the purpose of furthering sustainable tourism, teamwork in tourism operators with the local communities and conservation organisations must be a factor in consideration. Through this, the operators will be able to combine the AI-driven sustainability initiatives with local efforts so that tourism benefits destinations economically, socially, and environmentally. This approach enhances the destination's attractiveness to travellers who have eco-awareness but are supportive of greater goals of environmental conservation and community development.

Finally, tourism operators should take active steps to convey the sustainability benefits of AI-driven initiatives to the travellers. This helps operators to inform and inspire travellers about the importance of responsible tourism, highlighting what happens because of choosing sustainable options during their trip.

6.4 Study Limitations and Future Research

While this study is necessary for the role of AI in tourism, it does not go without limitations. Whereas the sample size may be sufficient to represent the purpose of this study, it might be too small to fully represent the diverse experiences that travellers go through in different regions and cultures. Thus, further research might expand on this sample size, as well as include further types of travellers from a wide range of destinations to get a better understanding of AI's actual impact on tourism.

Another limitation is the nature of the study being cross-sectional; hence, it represents the experiences of the travellers at one point in time. Longitudinal studies that track changes in AI adoption and satisfaction over time would go a long way toward offering deeper insight into how these technologies influence the travel experience in the long run. Moreover, although the investigation of the role of demographics in AI adoption has been done in the current study, future research might focus on other eventual antecedents such as socio-economic status, travel frequency, and familiarity with technology that may also be relevantly significantly contributing to shaping the experience of travellers with AI.

Lastly, with the constant development of AI technologies, it is worth studying the effect that new emerging AI tools and platforms will have on the tourism industry in the future. For instance, studies on combinations of AI with other technologies such as blockchain, IoTs, and AR could further revolutionise the experience of travel. Understanding how these technologies interact with AI and with each other would provide considerable insight for both the academic community and industry practitioners.

6.5 Conclusion

This research investigation contributes to the increasing literature on AI in tourism by providing an in-depth analysis of how AI-powered personalisation influences tourist satisfaction and engagement. The results bring into the foreground the massive possibilities of AI in improving the travel experience, especially through personalised services according to individual preferences and needs in real time. On the other hand, the investigation also puts into perspective that usability and privacy are aspects which, when attended to, will maximize benefits offered by AI in all demographic groups. By doing so, destination managers or policymakers reach an optimal point where they will be making full use of AI to create more satisfying, engaging, and sustainable travel experiences.

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Annex A – Survey Questions

Q-1. How frequently do you travel for leisure?

☐Never

☐ Rarely

☐Occasionally

☐Frequently

☐Very Frequently

Q-2. Have you ever used AI-powered services during your travels?

☐Yes

☐No

If No, skip to Question 6

Q-3. Which AI-powered services have you used? (Select all that apply)

☐Personalised travel itineraries

☐AI chatbots, Smart hotel room features

☐Virtual assistants

☐Others

(please specify)

Q-4. On a scale of 1-5, how satisfied were you with the AI-powered services you used?

☐1 (Very Dissatisfied)

☐2

☐3

☐ 4

☐5 (Very Satisfied)

Q-5. What specific AI-driven features did you find most beneficial during your travel?

☐Personalised travel itineraries

☐AI chatbots for customer serviceL

☐Smart hotel room features (e.g., voice-controlled lights and temperature)

☐Location-based recommendations for restaurants and attractions

☐Others

(please specify)

Q-6. Would you be willing to share personal data for a more personalised travel experience?

☐ Yes

☒No

Q-7. What personal data would you be comfortable sharing for AI personalisation? (Select all that apply)

☐ Travel preferences

☐Health information

☐Social media activity

☐Purchase history

☐ Location data

☐None

Q-8. On a scale of 1-5, how concerned are you about privacy issues related to AI personalisation?

☐1 (Not Concerned)

☐2

☐3

☐4

☐ 5 (Very Concerned)

Q-9. Do you believe AI can improve your travel experience?

☐Yes

☐No

☐ Unsure

Q-10. How did AI-driven personalisation impact your engagement with the destination's offerings?

☐Significantly Decreased

☐ Decreased

☐No Impact

☐Increased

☐Significantly Increased

Q-11. What challenges or issues did you encounter with AI-powered services?

☐Inaccurate or irrelevant recommendations

☐Privacy concerns regarding data usage

☐Difficulty in using the AI technology

☐Lack of human interaction

Others

(please specify)

Q-12. Do you prefer AI-driven personalisation over traditional travel services?

☐Yes

☐No

☐Depends on the Service

Q-13. How likely are you to recommend AI-powered travel services to others?

☐Very Unlikely

☐Unlikely

☐ Neutral

☐Likely

☐Very Likely

Q-14. What demographic group do you belong to?

☐Under 18

☐18-25

☐26-35

☐36-45

☐46-55

☐56-65

☐Over 65

Q-15. Does your demographic group influence your preference for AI personalisation?

☐ Yes

☐ No

☐Not Sure

Q-16. What is your primary mode of travel?

☐Airplane

☐Train

☐ Car
☐Cruise
☐ Others (please specify)

Q-17. How important is personalisation in enhancing your travel experience?

☐Not Important
☐Slightly Important

☐ Moderately Important

☐Very Important

☐Extremely Important

Q-18. What improvements would you like to see in AI-powered travel services?

Click or tap here to enter text.

Q-19. Do you think AI personalisation can cater to special needs or preferences (e.g., dietary restrictions, mobility issues)?

☐Yes

☐No

☐Unsure

Q-20. Would you prefer more human interaction over AI even if AI services are available?

☐ Yes

☐No

☐Depends on the Context

Annex B – Interview Script

Hello,

Thank you for taking the time to participate in this interview. My name is Ankit Chauhan, and I am currently working on my master's thesis at ISCTE. My research focuses on the role and impact of Artificial Intelligence (AI) in personalizing tourist experiences within smart destinations. The aim of this study is to explore how AI can enhance travel experiences and its effect on tourist satisfaction and engagement.

During this interview, I will be asking you a series of questions about your experiences and perceptions related to AI-driven personalisation in travel. Your insights will be invaluable in helping me understand the real-world implications of AI in the tourism industry.

The interview will take approximately 20 to 30 minutes. With your permission, I would like to record our conversation to ensure accuracy in capturing your responses. All information will be kept confidential and used solely for academic purposes.

Q-1. Can you describe a recent travel experience where AI played a role in personalizing your journey?

Q-2. What specific AI-driven features or services did you find most useful during your travel?

Q-3. How did AI personalisation enhance your overall satisfaction with the destination?

Q-4. In what ways did AI influence your engagement with the destination's offerings?

Q-5. What kind of variations did you notice in AI personalisation based on your preferences? If so, please elaborate.

Q-6. How comfortable are you with sharing personal data to receive personalised experiences?

Q-7. What privacy concerns, do you have regarding AI personalisation in travel?

Q-8. What challenges did you face with AI-driven services during your travel?

Q-9. in what way do you believe AI personalisation can significantly improve future travel experiences?

Q-10. What improvements or additions would you suggest for AI personalisation in smart destinations?

Q- 11. Is there anything else you would like to add about your experience with AI in tourism?

Thank the participant for their time and insights.