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Impact of Smart Tourism Technologies in the Tourist Experience

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ABSTRACT

This dissertation explores the impact of smart tourism technologies on tourists, focusing on the importance of social media, generational usage patterns, and the transformation of the customer journey map. Through a comprehensive analysis, this study reveals how these technologies are reshaping the tourism industry, influencing tourism behaviors, expectations, and experiences.

Social media has become an essential tool throughout the travel journey, from inspiration and planning to real-time updates during and post travel. User-generated content and influencing posts significantly influence travel decisions, while businesses leverage social media for marketing, engagement, and feedback, enhancing customer satisfaction and loyalty.

This research highlights distinct generational differences when using smart tourism technologies. Generation Z and Millennials are more open to these technologies, as they value personalized, tech-enhanced experiences and seamless connectivity. On the other hand, Generation X and Baby Boomers adopt these technologies selectively, prioritizing convenience and safety.

Smart tourism technologies have significantly altered the traditional customer journey map, introducing new dimensions of interactivity and personalization in each stage (prospective phase, active phase, and reflective phase).

The synthesis of these themes illustrated the interconnectedness of social media, generational usage patterns, and customer journey in shaping the modern tourist experience. Smart tourism technologies have revolutionized interactions between tourists and destinations, leading to more informed, connected, and satisfying travel experiences.

A quantitative investigation will be conducted though a questionnaire answered by 200 people. Through it will be discover that one of the main smart technologies used by the younger generations is social media, where they get inspiration and are able to connect with other travelers, they also use AI and virtual reality tools. On the other hand, the older generations are more drawn to search engines technologies that help them plan the trip by choosing the options that best suit their preferences.

The findings of this dissertation underscore the importance of leveraging smart tourism technologies to enhance the service and offer tailored trips to the diverse generational needs.

This research provides valuable foundation for future studies and practical applications, guiding stakeholders in maximizing the potential of smart tourism technologies.

Keywords: Smart tourism technologies; Social media; Customer journey; Generational differences; Tourist behavior; Travel experience.

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ACRONYMS AND ABBREVIATIONS

AI	Artificial Intelligence
AR	Augmented Reality
EC	European Council
GDP	Gross Domestic Product
ICTs	Information and Communication Technologies
IoTs	Internet of Things
SDGs	Sustainable Development Goals
SM	Social Media
SNSs	Social Network Systems
ST	Smart Tourism
STDs	Smart Tourism Destinations
STE	Smart Tourism Ecosystems
STA	Smart Travel Attractions
STTs	Smart Tourism Technologies
UNEP	United Nations Environmental Program
UN	United Nations
UNWTO	United Nations World Tourism Organization
VR	Virtual Reality
WTTC	World Travel and Tourism Council

1. Introduction

This dissertation explores the comprehensive impact of Smart Tourism Technologies (STTs) on travelers throughout all stages of their customer journey. The main question addressed is: “How are smart tourism technologies (STTs) influencing the touristic experience?.” This investigation aims to fill the gap in existing literature, which tends to focus primarily on the various technologies themselves rather than on their effects on travelers.

Current studies on smart tourism technologies as the one by Buhalis,et al., (2015) or the one by Gretzel et al., (2015) among others, predominantly focus on the smart technologies’ functionalities and innovations. However, there is a notable lack of research on how these technologies affect travelers’ experiences, decisions, and overall satisfaction. This study aims to close that gap by examining the influence of smart tourism technologies on travelers, providing a more holistic understanding of their impact.

This research was conducted between September 2023 and July 2024, it focuses on how smart tourism technologies are reshaping the touristic experience, providing insights from a diverse group of travelers. It will first follow a literature review where some hypothesis will be proposed and then confirmed throughout a quantitative research.

As the methodology for the dissertation a quantitative research was carried out through a survey, which goal was to recollect information on how tourists use smart tourism technologies depending on their generation with the objective of confirming the different hypothesis proposed on the dissertation, by analyzing the data obtained through the questionnaire survey.

The questionnaire was aimed at the guest of the 2060 The Newton Hostel in Madrid, between the course of three weeks of April 2024 (4/042024 - 23/04/2024). The decision to use a Hostel is due to the fact that travelers that choose to stay in hostels usually tend to have a deeper sense of their impact not only on the environment but on the culture as well.

The structure the dissertation will follow is first a section where basic information about the context of sustainable tourism is provided, then an introduction on smart tourism technologies and relevant concepts who will lay the groundwork for the further discussion on the dissertation, followed by a section where the importance of social media as an influential tool during travel and experiences, in relation to it, on the next section examines how different generations use smart tourism technologies. On to the next section where a customer journey map is presented to show how travelers interact with smart tourism technologies during the various stages of the journey. Then a quantitative research will be carried out through a

questionnaire, which consisted of 41 questions, which we will divide into two sections, the first one consist of two demographic questions, and the second one with 39 question designated as items, these items, at the same time will be divided into four subsections, the first one consisting of 6 questions about the prospective phase of traveling, the second one sixteen questions about the behavior and usage of smart tourism technologies during the active phase of the trip, the next part consist of seven questions related to the reflective phase, and the last part with nine questions about the satisfaction of using STTs and the revisit intention. The questionnaire was answered by two hundred guests from the 2060 The Newton Hostel in Madrid, this hostel was chosen as a setting for this study because travelers who usually stay at hostel rather than hotels, tend to have a deeper awareness of their environmental and cultural impact. This statement is confirmed by studies the one written by Juvan, et al.,(2014); and the one Lee, W. H., & Moscardo, G. (2005).

There are two major reasons to carry out this study, the first one is because tourism is one of the main industries now a days, is significantly contributes to the global GDP, driving economic growth and creating jobs, to the point where some countries live from the money made from this industry. The United Nations World Tourism Organization (UNWTO) highlights that tourism has notable environmental and social impacts, making it a necessity to find a balance between growth and sustainability.

The other main reason is because in today's digital age, technologies play a crucial role in shaping various industries, including tourism. Smart tourism technologies enhance the travel experience by providing personalized services, improving efficiency, and enabling sustainable practices. Understanding their impact on travelers is essential for developing strategies that leverage these technologies to benefit from touristic destinations.

By focusing on these areas, this dissertation aims to provide a comprehensive understanding of how smart tourism technologies influence the touristic experience, contributing valuable insights to the field of tourism research.

2. Literature review

2.1 History of sustainable tourism

The United Nations Environmental Program (UNEP) and the World Tourism Organization define sustainable tourism as the development of touristic practices which are focused on an environmental, economic, and socio-cultural sustainable balance (UNWTO, 2005). Pan et al. (2018) suggests that to assure both short-term and long-term sustainability in the sector there should be a balance between the four areas.

Before moving into the topic, it is essential to revise the history behind the matter. Between the 1960s and 70s, we could mark the early beginnings of the environmental movement, in 1962 Rachel Carson published “Silent Spring”, which raised awareness about environmental degradation, ten years later in 1972, the United Nations conference on the human environment, which was held in Stockholm, marked the first major international gathering to discuss global environmental issues, setting the stage for sustainable development concepts. In the 1980s, the term “ecotourism” started gaining popularity, emphasizing responsible travel to natural areas that conserve the environment and improves the wellbeing of local people. Hall (2010) mentions that the tourism field started giving considerable importance to the issue during this decade. In 1983 the International Union for Conservation of Nature (IUCN) defined sustainable development as improving and maintaining the well-being of people and ecosystems, influencing the tourism sector to consider environmental and social impacts. In 1992, in the Rio conference the UN created “Sustainable Development Agenda 21”, a comprehensive plan of action to build a global partnership for sustainable development, in chapter 28th of the plan sustainable tourism is emphasized. Later in 1996 the UNWTO, the World Travel and Tourism Council (WTTC) and the Earth Council (EC), produced a new version which focused on tourism.

The beginning of the 2000s can be seen as the growth and development of sustainable tourism, in 2002 the United Nations declared the international Year of Ecotourism, raising awareness and promoting ecotourism as a tool for sustainable development. In 2012 during the Rio + 20, the UN generated a new document named “The future We Want” which highlighted the role of tourism in the transition to a green economy under the context of sustainable development. The latest version of this document “2030 Agenda” was created in 2015, where 17 Sustainable Development Goals (SDGs) first appeared. (United Nations General Assembly, 2015), goals 8 (Decent work and economic growth) and goal 12 (Responsible consumption and production) directly addressed sustainable tourism. 2017 was

declared the international year of sustainable tourism for development by the UN, highlighting tourism´s role in fostering inclusive and sustainable development (Ferreira, 2023).

The COVID-19 pandemic brought significant changes in global tourism, which increased emphasis on sustainability, resilience, and the importance of supporting local communities and environments. One of the current trends is regenerative tourism, which emerges as a concept that goes beyond sustainability. This new concept aims to restore and rejuvenate ecosystems and communities. Another, which we are going to focus on, is the usage of Smart Tourism Technologies (STTs) (Ferreira, 2023).

2.2 Sustainable tourism and smart technologies

Smart tourism technologies (STTs) refer to the incorporation of information and communication technologies (ICTs) to enhance various facets of the tourism industry, with the goal of providing a more efficient, interactive, and personalized experiences for both tourists and industry stakeholders (Sustacha et al., 2023). These technologies leverage data, connectivity, and digital solutions to optimize operations, improve customer satisfaction, and create a more intelligent and sustainable tourism ecosystem.

Some scholars highlight the importance of studying this topic, Shen et al. (2020) points out that digitalization is not a trend anymore, and adds that it has become an everyday reality, making the use of technologies in the tourism industry grow, making them essential elements. They add that the use of technologies creates more expectations in terms of experiencing a destination or a specific attraction. Consequently, Tourism destinations and attractions must address the new opposed challenge by adopting and implementing smart infrastructure and technologies in their offer by designing and creating an attractive and memorable tourism experience (Shen et al., 2020).

At the same time, the use of STTs should also help promote the sustainability in the sector, Juvan y Dolničar (2014) on their research about the attitude-behavior gap in sustainable tourism point out that tourists should be the main targets when attempting to promote the environmental sustainability of tourism as they are the most promising.

Smart Tourism Destinations (STDs) would set the best framework and Smart Tourism Technologies (STTs) would provide the appropriate tools (Shen et al., 2020). Zhang et al., 2022, suggest that smart technology can help tourism destinations to improve the management and efficiency of the tourism resources, by promoting the best utilization and improving the life quality of the residents and tourists. Due to the recent developments in technology and the transition to a digital world, different information networks regarding sustainable tourism have been created as ICTs are essential for data collection and analysis (Pan et al., 2018). In addition, an effective marketing plan and the use of social media can notably increase the awareness of the tourist impact (UNWTO, 2017) as tourists use technologies all through the process, from the information research, to purchase decision to the evaluation.

Smart concept

The smartness concept originated in the 1990s, as new information and communication technologies (ICTs) appeared (Angelidou, 2015). The concept of “smart tourism” references

the tourism industry within the context of information and communication technologies (Pen et al., 2018). In the tourism industry we could relate this term in three separate ways, smart cities, smart destinations, and smart ecosystems (Gretzel, Werthner, Koo, & Lamsfus, 2015). In their research Platov et al, (2021) pose that smart technologies are products and services that by encouraging the interaction, co-creation and customization, they add value to the services. Before going more in depth with each concept it is essential to remark that smart technologies do not only mean the improvement of a single technology, but also the simultaneous interrelationships of various (Shen et al., 2020). This concept is used to describe modern processes as there is a need to link many activities, in this case tourism, with information and communication technologies, this process is the consequence of the changes in consumer behavior. (Platov et al., 2021). Shen et al. (2020) said that the goal of a smart tourism framework is to achieve a balance between the wellbeing of the tourist and the population of the area visited, it should be beneficial and should create positive outcomes to both, limiting the effects of tourists of the destination.

Smart cities

Gretzel et al. (2015) defines a smart city as a city that uses ICTs to optimize resource production and consumption, Piro et al. (2014) adds that a smart city should be able to offer advanced and innovative services to improve the quality of life. In compliance Harrison et al. (2010) remark that a smart city connects the physical infrastructure with ICTs, in particular technologies that lead to sustainable development (Caragliu, Del Bo, & Nijkamp, 2011). Bacici et al. (2013) points out that the main ICTs used by smart cities are social media, big bata, AI, cloud computing and Internet of Things (IoTs). Other literature researches identify three main drivers for cities to make use of ICTs, community, technology, and policy, and predict six desired outcomes which are productivity, sustainability, accessibility, wellbeing, livability and governance (Yigitcanlar et al., 2018). Moreover, smart cities are envisioned as ecosystems where smart governance and participatory frameworks enable citizens to play an active role in decision-making and urban planning, consequently fostering more inclusive and resilient urban environments.

The relationship between smart cities and tourism is particularly significant, as the integration of ICTs enhances the tourist experience by offering personalized services, real-time information, and efficient urban mobility. Technologies such as mobile applications, augmented reality, and IoTs provide tourists with interactive city guides, smart transportation systems, and instant access to local attractions, accommodations, and cultural events. Furthermore, big data analytics in smart cities enable the development of tailored marketing

strategies and better crowd management in popular spots, ensuring sustainability while enhancing visitor satisfaction. Smart city initiatives also contribute to the creation of smart destinations, where innovative technology supports the seamless interaction between tourists, businesses, and the local community.

Smart tourism destinations

The smart tourism destination (STD) concept appeared as an ensemble of smart cities (Boes et al., 2016), to emphasize the use of smart in the economy context and magnify the experience of both residents and visitors (Gretzel et al., 2016; Romão et al., 2018). The concept is based on the generalized use of sustainability as a destination cannot be referred to as smart if it is not sustainable (Platov et al., 2021). These authors also point out that smart technologies used in a touristic destination are designed to solve the main problems of sustainability and should be able to meet the tourist's expectations and increase their satisfaction. Smart destinations promote the integration and interaction of tourists in the environment and improve their experiences (Segittur, 2015). Shen et al., (2020) as well as Ballina et al. (2019) believe that tourist should co-create tourism experiences and co-manage touristic resources, creating a link between STDs and sustainable management as they encourage tourist to have a more responsible behavior while generating benefits and competitive advantage (Boes et al., 2015). Supporting that argument Lopez de Avila (2015) poses that the more innovative and accessible, the more it will facilitate the interaction with the tourist and improve the experience.

Smart tourism ecosystems

To enclose both terms, the concept of smart tourism ecosystems (STE) was created. Ecosystems usually are defined as interaction of organisms within the environment (TheFreeDictionary, 2015). Werthner (2003) described STE as an intelligent touristic system that supports different nodes in diverse environments, characterizing it as a communication that enables accessibility to information anywhere and at any time. Therefore, these ecosystems focus on interactions between technological agents (Gretzel et al., 2015). Boley and Cang (2007), believe that ecosystems have four main qualities, interaction between the agents, there needs to be a balance, all the actors have the same goals and finally that they are self-organized. This means that the actors, whether individual or groups, form relationships to increase the individual benefits and at the same time achieve shared goals (Gretzel et al., 2015). This taken to the tourism industry is understood as an ecosystem that focuses on the production and

consumption of touristic value, with the goal of creating meaningful experiences (Gretzel et al., 2015). This idea is shared by Buhalis and Amaranggana (2014) that pose that the goal of an STE is to produce enhanced, high-valued, meaningful experiences, in order to achieve this, the digital ecosystem helps by providing technological resources and providing amounts of data, which can later be used to create personalized experiences.

Smart environments and technologies

Finally smart tourism (ST) entails touristic activities that are supported by smart technologies (Gretzel, Sigala, Xiang & Koo, 2015a). Li et al. (2017) poses that smart travel, or tourism was a unique creative tourism. In their research Liberato et al. (2018) proposed that smart travel was the first change in the development of tourism. Buhalis (2019), believed that ST is an integration created by the new generation led by information and communication technologies. On the other hand, Shen et al (2020), believe that ST is a combination of touristic infrastructure and ICTs tools, whose goal is to increase the efficiency of businesses and touristic experiences. He identifies 3 main points: enhancement of experiences, improvements in resources and gaining competitiveness in sustainability. Platov et al. (2021) interpret ST as a type of tourism in which the use of smart technologies adds value to the services, creating the term Smart Travel Attractions (STAs), the researcher explains how the advances in AI, big data and 5G have contributed to the appearance of this STAs, at the same time they have switch the focus on the view of smart technologies in studies from a technology orientation to a demand orientation, as the visitors satisfaction is essential in quality management.

In these types of smart environments, Information, and communication technologies (ICTs) provide and exchange information and facilitate collaboration with different stakeholders (Jovicic, 2019) as ICTs can help manage and address tourism behaviors and flows (Trunfio & Pasquinelli, 2021). The most used IoTs are named and briefly explained in table 1.

Lan et al. (2021) exposes the importance of smart tourism service platforms, where data is stored and used to provide more wide-ranging services and make the experience as personalized and authentic as possible. The scholars agree on the importance of this model to promote the transformation and development in the sector. As it is pointed out before, the basis of the idea of smart tourism is to personalize the experience, Skavronskaya et al. (2019) express how ST makes the experiences more interactive, as the smart tourism service platforms collect information and promote the upgrading of the industry.

The objective of innovation is to make better services and improve satisfaction, for that innovation to happen, it is essential to use technologies such as IoTs, big data, cloud computing and other technologies (Lan et al., 2021).

As Shen et al. (2020) say in their research, it is essential for tourism attractions and businesses to add smart tourism technologies (STTs) to their management to improve the effectiveness of operations and performance, be more attractive and create an advantage. Smart tourism technologies (STTs) are infrastructures that integrate hardware, software and networks with travel services and provide amounts of data to stakeholders with the objective of creating smarter decisions.

Smart technologies now a days are used all the time on our daily lives, their form can vary from wearable devices like smart watches, to mobile devices and applications to non-physical and visible technologies like Internet of Things networks or Big Data. Table 1 represents the main smart technologies used by the touristic industry.

Table 1: Smart technologies: Forms and short description

Internet of Things (IoTs)	A network capable of processing identification, location, tracking, monitoring, and management, connecting the goods with the network for information exchange and communication.
Artificial Intelligence (AI)	Technology that allows use of computer software and hardware to stimulate intelligent human behaviors to effectively process and analyze data and information and to support decision-making and problem solving.
Mobile communication technology	The technology used for wireless communication allows wireless real time connection between systems and remote devices.
Mobile devices applications	Electronic equipment such as mobile phones and tables, and the technology connected with them.
Big Data	Big data is a term that describes the large volume of data (structured and unstructured).
Virtual Reality (VR)	A form of information technology which enables users to navigate in computer-stimulated environments in which people can experience places and situations as if they were actually present.
Augmented Reality (AR)	An enhanced version of reality by which people see the real world with digital display technology.
Intelligent chat robot	A robot able to understand and talk using human language with users.
Wearable devices	A portable device that can be worn directly on the body or integrated onto the users' clothes or accessories.
Beacon network	Transparent GIF or PNG images that can be hidden in any web element or email are often used to collect data.

Source: Own elaboration

Smart destination management

Smart technologies play a crucial role in promoting sustainable tourism by enhancing efficiency, reducing environmental impact, and improving the visitors' experiences.

Smart destination management can be achieved through smart technologies that enable the collection and analysis of data related to visitor behavior, resource usage and environmental impact, analyzing data can also help with the prediction of peak tourist seasons, enabling better resource allocation and crowd management. For energy efficiency the usage of utilizing energy efficient technologies can help reduce the energy consumption and carbon emissions, also by integrating renewable energy sources can help infrastructures to decrease the reliance on non-renewable resources. Waste management can also be achieved by the integration of smart bins that optimize waste collection and recycling technologies that help with waste separation. Digital platforms and apps for eco-friendly activities can be created as a way of promoting responsible tourism and sustainable practices and can help tourists make more environmentally conscious choices (Ivars-Baidal et al., 2019).

Some of the most used technologies are cloud computing and the internet of things (IoTs), these tools help by perceiving and collecting information about resources, the economy, touristic activities and the tourist itself, and then sharing that information in order to create and arrange experiences (Kharisma and Muni, 2017). With the creation of smartphones and the emergence of user generated content and social media the consumers have become more skilled, they are more active, independent, and informed, and has led to new forms of planning, sharing and recommending, creating a digital tourist (Shen et al., 2020). In 2013 McKinsey Global Institute identified that mobile communication devices, location-based services, Internet of things, augmented reality and sematic web would alter the way people act and think (Manyika et al., 2013). Some scholars like Zhu et al. (2019) and Du et al. (2020) believe on the importance of big data not only to tourism management but to the development of tourism globally, as the combination of big data and cloud computing can generate new value to the data of operators.

ICTs and STDs have become a current topic in research nowadays (Boes, Buhalis & Inversini, 2015; Buhalis, 1998; Buhalis & Amaranggana, 2014; Del Chiappa & Baggio, 2015; Gretzel, Yuan, and Fesenmaier 2000; Gretzel, Sigala, Xiang & Koo, 2015). Which tends to focus on the evaluation and use of the different technologies, but not on the implications and impacts, as digital advances and devices change the way tourists interact (Hughes & Moscardo, 2019).

The usage of smart tourism technologies (STTs) has become a primary requirement in the industry. As pointed out before, they can be used to obtain information, technologies such as augmented realities give the tourist the opportunity to sample different services and products

(Torabi et al., 2022). The different tools can enhance the tourism experience and generate value (Neuhofer et al., 2015). Ivars-Baidal et al., (2019) and García-Hernandez et al., (2019) postulate that some tools can address overtourism, but they are not capable of reversing it.

2.3 Importance of social media in tourism

Social media (SM) has also become an essential not only for the travelers but for the companies, as creating an engagement between the brand and the client requires higher levels of participation and interaction (Oh et al., 2017) such as like, sharing and commenting posts (Wang et al., 2017). Social media (SM) allows us to interact and communicate with other users (Shen et al., 2020). Pansari and Kumar (2017) add that a great level of engagement between companies and customers can result in higher market share and greater customer satisfaction. Agostino (2013) shared that to improve the commitment there must be an active participation of users who like, reply, tweet, comment and generate diverse user-generated content (UGC).

Cabiddu et al. (2014) identified three levels of tourist engagement through SM, the first one is when dialogue is maintained, which he calls persistent, the second one, customized, references when the interaction with the customer happens on a more personal level, and the last one, triggered, is when the customer itself initiates events where interactions are provoked. Through these interactions, social network systems (SNSs) are created, they are online communities of individuals with shared interests, these SNSs enable the members of the community to interact and share their knowledge and experiences. As Shen et al. (2020) said, SM has changed people's lives.

When referencing the tourism industry, SNSs have become a key element in decision making, as travelers investigate and interact with other tourists as a way of getting information about their touristic experiences, with the aim of creating and choosing the best experiences and services for their trip (Shen et al., 2020). Social media and social networks are not only important for the tourist, but for the companies and destinations as well, Hysa et al. (2021) poses that SM can promote destinations by getting the content and information to the targeted customer.

Sustacha et al. (2023) on their research concluded that the effectiveness of smart tourism technologies depends on accessibility, informativeness, interactivity and personalization, this was supported by Buhalis et al. (2015). Accessibility refers to the degree in which information can be obtained online (Um and Chung, 2021) as the less time spent searching the most satisfied is the customer (Pai et al., 2020); Information referring to accurate and credible information (Buhalis et al., 2015) Kim and Hiemstra pointed out that the quality of the information is essential for tourist as they create their own perception of the destination; Interactivity alludes to the degree real time information provided to visitors (Huang et al., 2017); And finally personalization, level in which tourist are provided with their needs (Buhalis and Amaranggana, 2015). Later other scholars added another dimension, Security which refers to the degree of confidentiality and private information.

The fast evolution of ICTs and the internet has completely transformed the way people travel (Xiang et al., 2015) and the way experiences are lived (Soliman, Cardoso, Almeida, Araújo, & Araújo Vila, 2021). Hughes and Moscardo (2019) pose that modern technologies are affecting the touristic experience in five different ways: choice, connection, co-creation, customization, and compliance. Yeoman (2012) believes that this change has been identified as a weakness in research and practice. Trunfio and Pasquinelli (2021) investigate how the different tools can manage flows and impact the tourist behaviors, smart tools can change the role of stakeholders, they can shape tourists' preferences and expectations, and they can change the way the community addresses tourism flows.

2.4 Generational use of smart technologies

When talking about this topic it is essential to highlight that not everyone uses smart tourism technologies the same way, it depends on the generation, as not everyone has the same expectations and requirements when planning a holiday (Hysa et al., 2021). The author in his study “Social media usage by different generations as a tool for sustainable tourism marketing in Society 5.0 idea” exposes the different uses depending on the different generations.

Nieves et al. (2015), states that the younger generations such as generation Y and generation Z are considered digital natives, as they are more comfortable with technologies. Prensky (2001) also emphasized that as the younger generations have grown up in the digital age, they are quicker to adopt new technologies and on the contrary older generations, such as baby boomers and generation X, often demonstrate a slower rate of adoption (Brosdahl et al., 2011). Not only that, Gretzel et al. (2015) explain that millennials and generation Z tend to prioritize convenience and personalization. Leung et al. (2013) examined the role of social media in tourism, emphasizing how younger generations use platforms like Instagram and TikTok to share their experiences.

As they point out, baby boomers (1945-1964) are associated with a well-established social position and a bunch of financial possibilities, most of the individuals that form this generation are already retired, and as they have a great economical background, they are willing to spend more money on their trips. This generation mainly uses smart technologies and social media, specifically Facebook, to stay connected with friends and family. They post photos and recaps of their trips; their main way of engaging is through comments and likes. When traveling they use platforms like TripAdvisor or Expedia for planning and researching their trips, although they are less technological than younger generations, they use STTs for booking and planning, as a navigation tool and to access information in digital guides, they usually prefer technology that simply their travel experience without being overly complex as they usually seek assistance in learning how to use new devices and applications.

Generation X (1965-1980), although they were born during analogical times, they have perfectly adapted to the digital era, as they use technologies on every step when planning their trips. They use social media to share travel experiences but also to gather information, creating and consuming content at the same time, this generation usually prefers platforms like Facebook and Instagram to interact through comments, sharing and participating in travel related groups. Generation X is usually comfortable with technology and implements it in various aspects of travel like planning and leaving reviews and tips, they use STTs for booking, planning, navigation, and communication.

Generation Y (1981-1995), also called Millennials, has been carved by globalization, merging of cultures, disappearance of borders and the wide availability of products worldwide. This generation is characterized by traveling more than Baby boomers and gen X, they are more eager to leave their homes and explore, they have a strong need of using the opportunities generated by SM. They like to share their experiences as they have matured at the same time as the digital world, making them more active on the internet. Millennials are prolific content creators, during their time platforms like YouTube were created and they started to create video content. They use social media as a way of documenting their travels, mainly using platforms like Instagram and YouTube. These generations' interactions are dynamic, they like, comment and share content. For this generation, social media is crucial for traveling, they use it for booking and planning, looking in social media platforms for recommendations, they give reviews and recommendations, they use augmented reality for enhanced exploration and learning about destinations and finally they use wearable technology. They prefer technologies that offer convenience, personalization, and social sharing.

The last, Generation Z (1995-2010), are multitaskers, they have grown with the internet as their main way of communication, they search for information on different social platforms, from reviews to user generated content, although as they are still not employed, they lack of financial support making these the most prominent users when using tools like Skyscanner that gives you the cheapest option (Hysa et al., 2021). Generation Z prioritizes creating visually appealing and engaging content, their main platforms to do so are Instagram and TikTok, where they create short videos and post real time updates.

As Hysa et al. (2021) commented before, they are highly interactive on social media through comments, likes and shares, and they rely heavily on technology for everyday activities. This generation expects seamless and integrated experiences. They use STTs for booking, planning, social media for content creation, mobile payments and digital wallets, augmented reality and virtual reality for virtual tours and interactive experiences and lastly, they use smart devices.

Table 2: Generational use of Smart Tourism Technologies

Generation	Use of STTs
Baby boomers (1945-1964)	Retired Look for comfort and relaxation Less technological STTs to stay connected
Generation X (1965-1980)	Born in analogical times Comfortable with technology STTs for booking, planning, navigation and communication Share experiences in social media (Facebook and Instagram)
Generation Y (1981- 1995)	Matured at the same time as the digital world Content creators (Instagram and YouTube) Social media crucial for travel STTs for every step of the trip
Generation Z (1995-2010)	Internet as main form of communication User generated content (Instagram and TikTok) Expects seamless and integrated experiences STTs for every step of the trip

Source Own elaboration

Therefore, after analyzing each generation two hypotheses are proposed:

Hypothesis 1: Smart tourism technologies have more impact on younger generations than older ones.

Smart tourism technologies, such as mobile travel apps, virtual reality experiences, and AI-powered recommendations, are transforming the way people explore destinations. Hypothesis 1 suggests that these technologies have a greater impact on younger generations than older ones. Younger individuals, typically more tech-savvy and accustomed to integrating digital tools into their daily lives, may find these innovations more accessible and engaging. In contrast, older generations might face barriers such as limited familiarity with new technologies or preferences for traditional methods of travel planning. This generational divide underscores the need for tailored approaches to technology adoption in tourism, ensuring inclusivity while maximizing the potential benefits for all age groups.

Hypothesis 2: Younger generations tend to use social media as a travel inspiration tool.

Social media platforms like Instagram, TikTok, and Pinterest play a significant role in shaping travel choices, particularly among younger generations. Hypothesis 2 posits that younger individuals are more likely to use social media as a source of travel inspiration compared to older generations. Visual content, influencer recommendations, and peer-shared experiences create a dynamic and engaging environment that resonates with their digital-first lifestyle. This

demographic often discovers new destinations, activities, and trends through these platforms, relying on them for planning and decision-making. Understanding this behavior can help tourism marketers strategically target younger audiences by leveraging the power of social media.

By examining these hypotheses through questionnaire, the aim is to provide insights into the different degrees of impact that technological advancements in tourism and the rise of social media have on different age groups. Understanding these differences can be of great use as it can change and transform marketing strategies and technological solutions that serve the specific needs and preferences of each generation.

2.5 Travel and tourism customer journey map

In recent years, a new trend has emerged in which tourists have now become active participants in co-creating value for the products and services that they will later acquire and consume. Social networking services or SNSs have become the main areas for doing so, they have transformed the tourist from passive consumers to active ones, as they share and comment and engage in reviews, evaluations and recommendations, creating a new tourist that co-designs, co-produces, co-markets the tourism experiences (Shen et al., 2020). Scholars have supported the benefit that comes from the interaction and co-creation of experiences by smart tourists. Neuhofer et al. (2012) were one of the firsts to suggest that tourist use smart technologies to interact dynamically with other stakeholders to create their own experiences, they believed that digital media platforms have become the main source of information for tourist, as people create and share information all the time with the hope of influencing others. STTs can help tourists by integrating content and improving the quality of their decision making (Xiang et al., 2015).

In 2011, Tung and Ritchie, described the tourism experience as an ensemble of sensations, experiences and emotions perceived by the tourist. Scholars say that the touristic experience is not limited to staying at the destination, but before, during and after (Buhalis et al., 2015; Wang et al., 2012; Xiang et al 2015).

Shen et al. (2020) agreed that smart technologies influence in all three phases of the customer journey, prospective phase, the first one is when the tourist do a deep information search, take decisions and purchase the products and services, the second phase, active phase, makes reference to when the tourist is on site, enjoying and consuming those products and services. The last phase, the reflective phase, refers to the recollection and satisfaction of the experience, it includes sharing memories, making recommendations and evaluating. This statement declares that digitalization is not just a trend but an everyday reality.

According to Lee and Jan (2022) the attributes of the smart tourism experience differ from the ones in a traditional experience regarding the aesthetic, usefulness, presence, trust and learning. Other authors like Zhang et al. (2022) explore the qualities of different digital technologies in the context of tourism that are later used in business with the goal of enhancing the experience, the satisfaction and producing a more effective management of the resources. In their research they concluded that technologies are highly related to experiences as they influence on several factors which are used as a determinant of customer satisfaction, and they can help the client create a personalized and unique touristic experience. It is essential to understand the travelers needs so the product created can be as close as possible to what they want, if the client's expectations are exceeded, the client will be much happier, and that

can create a loyal customer or end up in word to mouth diffusion. As Kim et al. (2004) said, technologies have changed the way people interact and have taken over our lives, as an example he poses that travel agencies create an online community to attract potential customers. Wang et al. (2022) added that new touristic products can be created and the already existing can be enhanced, since purchasing touristic products via online started rapidly growing (Levi and Weitz, 2001).

Kim et al. (2004) stated that although the importance of the online community was well established and accepted in the tourism industry, there still needed to be a lot more research on how it impacts on the community and the travelers themselves.

Platov et al. (2021) aimed to determine the impact smart technologies have on the tourists' experiences on sustainable and smart destinations, as some forms of tourism have a profound impact not only on sustainable development but on the preservation of the local culture. For that, they consider the customer journey map model, which consists on creating a visual representation of the process the customer goes through focusing mainly on the experience. The model suggests that within the customer journey 3 stages can be identified, which at the same time coincide with the ones established by Shen et al. (2020), the preparatory stage before the trip, which corresponds to the prospective phase, the second stage of active tourism and the third stage of reflection after the trip.

The prospective phase or preparatory stage, as the name says, consists of the process of gathering information, decision making and purchase of the products. During this stage, the customer relies on reviews, many searches for content created by other travelers on different platforms as a way of finding information and making decisions (Shen et at., 2020). Before leaving for a destination, tourists make different consultations as information sharing services are very critical (Lan et al., 2021). Smart and sustainable tourists tend to self-educate themselves by investigating the history and culture of the area, learning about traditions and customs in order to be as least disrespectful as possible (Platov et al., 2021). Tourists must comprehend the locations they visit to maximize their visit and at the same time anticipate the need of respect (Shen et al., 2020). In this phase, the role of technologies is to create a consistent marketing that is effective but that does not create high expectations.

In the prospective phase, travelers use STTs to collect information, explore services and products, and plan their trips. Tools such as travel websites, mobile apps, virtual tours, and AI-driven recommendation systems allow consumers to research destinations, compare options, and make informed decisions. During this stage, they search and plan their trips by browsing online resources, building expectations through visual and textual content, finalizing transactions such as ticket purchases and reservations, preparing for the trip, and reducing

risks by consulting real-time updates, travelers' reviews, and safety insights. Technologies like augmented reality, which provide previews of destinations, and online booking platforms significantly enhance the planning experience, setting the stage for a smoother journey. (Table 3).

This brings us to our third hypothesis, which was highly influenced by the one proposed by Shen et al. (2020) on their work.

Hypothesis 3: Smart tourism technologies enhance the prospective phase by offering tools and information, thereby positively influencing their travel decisions.

Smart tourism technologies, such as AI-driven trip planners, interactive maps, and virtual reality previews, play a pivotal role in the prospective phase of travel—when individuals research and plan their trips. Hypothesis 3 suggests that these technologies provide valuable tools and comprehensive information, significantly influencing travelers' decisions. By offering features like personalized recommendations, real-time updates, and immersive virtual experiences, these technologies reduce uncertainty and enhance confidence in travel choices. This ease of access to tailored, accurate, and engaging content enables travelers to make informed decisions, ultimately shaping their preferences and increasing satisfaction even before the journey begins.

The second phase, the active stage, corresponds to the time the traveler is in the destination itself, interacting with the different elements, in this phase is where the value is created (Shen et at., 2020). During this stage, sustainable tourists seek a balance between interaction and immersion in the culture without damaging or modifying it, as a way of creating new rewarding experiences. One of the main factors that takes part in this phase is the transport, as having an easy trip can enhance the positive tourist experience and reduce the tourist frustrations, this state of mind also helps them when interacting transforming the visitor into a much more appreciative and careful one (Lan et al., 2021). On this stage technologies tend to rise the possibility for tourists to manage their own visit, giving them more freedom to do activities and choose with their emotions, therefore increasing the degree of tourist attraction and satisfaction (Platov et al., 2021).

In the active phase STTs support travelers with real-time information and tools that help them make short-term decisions and enrich their overall experience. Technologies like GPS based applications aid navigation, while translation apps and AR and VR tools enhance communication and interaction with the local environment. Travelers use STTs to collect and recollect memories through photos and videos, facilitate on-site purchases such as tickets or dining reservations, and evaluate experiences as they happen. During this stage, consumer behavior revolves around navigating unfamiliar environments, enhancing enjoyment and

engagement, making spontaneous decisions informed by real-time updates, and capturing moments to preserve their memories. These technologies ensure that the experience is not only convenient but also deeply immersive and enjoyable. (Table 3).

As well as hypothesis 3, hypothesis 4 is influenced by the one proposed by Shen et al. (2020) on their study “The influence of Smart Technologies on customer journey in tourist attractions within smart tourism management framework”.

Hypothesis 4: Smart tourism technologies improve flexibility, provide convenience and speed, and facilitate engagement and enjoyment, resulting in a more attractive and memorable experience at tourist attractions.

Smart tourism technologies are transforming the way visitors experience tourist attractions by improving flexibility, convenience, speed, and engagement. Hypothesis 4 suggests that these technologies enhance the overall appeal and memorability of tourism experiences. Tools such as mobile apps, real-time navigation systems, and digital ticketing make visits more seamless and efficient, while augmented reality (AR) guides and interactive displays enrich engagement and enjoyment. These features allow tourists to tailor their experiences, explore attractions at their own pace, and access information effortlessly. By addressing practical needs and offering immersive, engaging opportunities, smart technologies create more satisfying and unforgettable visits, making destinations more attractive to modern travelers.

The third phase of post-consumption or reflective stage is where the tourists and visitors, as the name says, reflect on their trip, they reminisce about the experience, exchange information, and provide recommendations influencing other tourist's decisions (Shen et al., 2020). Huang et al. (2017) concluded that the perceived value of a tourist is an evaluation of their experience as in if the products and services consumed have met their expectations and demands. The main channels used for this are either travel blogs or social media, in the later years it has become a trend to write about the difficulties of the trip, these platforms and virtual communities make it easy for people to obtain information (Platov et al., 2021). In this phase we can see that the concept of perceived value has changed, from being perceived as benefits and cost, to being considered as a multi-dimensional term as it depends on different situations (Lan et al., 2021).

In the reflective phase STTs help travelers reflect on their experiences, share their journeys, and influence others. Platforms like social media, travel blogs, and review websites allow travelers to share images, videos, and stories while offering evaluations and recommendations for future visitors. Consumer behavior during this stage focuses on evaluating their overall experience, sharing their journey through reviews and social media posts, giving advice to peers and online communities, creating personalized content like blogs or vlogs, and

recollecting memories stored digitally. This phase plays a critical role in inspiring and influencing other travelers while also fostering a lasting emotional connection with the trip. (Table 3).

The fifth hypothesis proposed in the research is also influenced by the study conducted by Shen et al. (2020).

Hypothesis 5: Smart tourism technologies positively impact the reflective phase by offering platforms for tourism to share their experiences and insights, as well as to evaluate their trips, ultimately contributing to an attractive and memorable experience.

Smart tourism technologies significantly influence the reflective phase of travel by providing platforms for tourists to share their experiences, evaluate their trips, and relive memories. Hypothesis 5 suggests that these technologies play a crucial role in making travel experiences more attractive and memorable. Social media, travel blogs, and review platforms enable travelers to share insights, connect with others, and showcase their journeys, reinforcing positive emotions tied to their trips. Additionally, digital tools for organizing photos, documenting itineraries, or leaving reviews help tourists reflect on their experiences, assess their satisfaction, and provide feedback. This reflective engagement not only solidifies the enjoyment of past travel but also shapes expectations for future journeys, making the overall experience more impactful and fulfilling.

Table 3: Customer journey map; STTs and Customer behavior

Stage of travel cycle	Uses of smart technologies	Consumer behaviors in terms of actions
Prospective (pre-consumption)	Collecting information Searching about services and products Planning the trip	Searching and planning Building expectations Buying Preparation Reducing risk
Active (on site)	Real time information Making short term decisions Collecting and recording memories On-site purchase On site evaluation Searching	Facilitating navigation and communication enhancing experience and enjoyment Making short term decisions Collecting memories
Reflective (post-consumption)	Sharing images and videos Sharing knowledge and experiences Posting reviews and recommendations Giving advice Evaluation	Evaluation Sharing experiences Recommendations Creating content Influence Recollecting memories

Source: Own elaboration

2.6 Smart tourism technologies and customer satisfaction

The introduction of the technological advancements inside the tourism sector has brought new dimensions of convenience, personalization, and overall enhancement of the travel experience. Understanding the impact can provide valuable insights for tourism stakeholders, enabling them to create personalized experiences that adapt to the evolving needs and preferences of modern travelers.

According to Zhang et al, (2022) smart tourism technologies (STTs) are a crucial factor when it comes to increasing the visitors' experiences, thereby it is essential to research their perception of the influence of technologies. In their research Zhang et al. (2022) consider that at the end, tourist satisfaction is the result of the comparison between their expectations and the experience. The authors separate the term into two categories, the first one is specific satisfaction, which alludes to the emotional response while traveling, and the second one overall satisfaction which comprises every psychological state the tourist has gone throughout their trip.

As it is suggested in different academic research, satisfaction generates beneficial outcomes, such as word-to-mouth or repurchasing. Zhang et al. (2022) defines behavioral intention as the probability that a consumer will act in a specific way. On the other hand, Chen and Tsai, (2007) define it as the possibility of revisiting and recommending destinations. Zeithaml et al. (1996) pointed out that there are four items that can measure behavioral intention: purchase intention (1), word to mouth (2), money consciousness (3) and complaint behavior (4). Boulding et al. (1993) on the other hand believes that there are only two sides when it comes to measuring intention: Repurchase and word to mouth. Dong et al. (2023) poses that behavioral intention can be measured through three criteria: repurchase, recommendation and willingness to pay extras.

The theory of planned behavior (TPB) proposed by Ajzen (1991), is used in Torabi et al. (2022) research “Enhancing memorable experiences, tourist satisfaction, and revisit intention through smart tourism technologies”, this theory predicts and explores tourists behavior, and how likely a tourist is going to act on a certain scenario. The predictions are made through three factors: attitude towards behavior, subjective norms, and perceived behavioral control. Torabi et al. (2022) maintain that STTs are great complementary tools to make predictions, as they can generate a greater understanding, and tourists consult them to obtain accurate information and have a favorable experience.

The study conducted by Lan et al. (2021), demonstrates that smart travel solutions impact significantly on tourists' experiences. The great amount of data from the touristic sector is due

to the advances and appliance of smart technology (Alaei et al., 2019). As it is pointed out in the beginning of the study and by other scholars, smart technology plays a key role in developing and improving touristic products and services (Levi et al., 2019) as the different tools are used with the intention of personalizing products to increase customer satisfaction. In a study made by Cicerali et al. (2017) about the comfort factors related to tourism satisfaction they identified the ones that harmed the satisfaction level of tourists, which are sanitary factors, related to the cleanliness of the destination, social influence, as sometimes a fake image of the destination can be created in your mind, scenic factors, which also relates to the false image. Nawjin and Biran (2019), came upon the conclusion that although negative emotions affect the life of consumers, traveling can encourage emotions and counteract negative emotions.

Tourism experiences are very broad and abstract, scholars analyze it in a different way, Lan et al. (2021) on their work focus on three types of touristic experiences secular, aesthetic and stimulating through six perspectives which they believe are the main aspects when a tourist is on site: dining, living, traveling, sightseeing, shopping and entertaining. Tourist experiences can be seen as utilitarian, tourists while living the experience can be stimulated and pleasured in other ways such as aesthetically by the different environments or physically as traveling can open the tourist's horizons (Lan et al., 2021).

As scholars deduce, the tourist experience revolves around pleasure, happiness and pleasure are the main emotions seeked by the visitor. Pine and Gilmore (1999) state that the core of tourism is pleasure. Liang et al. (2018) once again mentions aesthetic pleasure as one of the two aspects of pleasure distinguished when it comes to a touristic experience, the other being secular pleasure, the first one references the emotions perceived throughout a transcendental touristic experience, and the second one obtained throughout a regressive experience. Pine and Gilmore add to this theory that the secular experience reflects on dining, safety, food and traveling comfort, and the aesthetic experience mirrors in sightseeing, and culture. They add another type of experience that we could denominate stimulating experience that arises with entertaining.

Emotions have been a topic of psychological study for a long time, as individuals react and act in diverse ways in complex environments depending on their arousal level. Wang et al. (2020) pose that the stimuli received by the environment is correlated to the touristic experience as both are measured by the level of arousal. For their research they use the arousal theory, which predicts the aftermath of low-arousal behavior, and high arousal behavior. This theory exposes how several factors such as sound, temperature and congestion affect the level of arousal in one way or another (Gnoth 1997; Kagan & Snidman, 1991). The theory was

proposed by Berlyne (1960) who remarked that people gain pleasure as they perform or take part in an aesthetic experience, according to the psychologist this experiences cause two types of arousal, the first one is gradualness, it refers to the type of arousal that grows gradually as you accept and experience, the second one is hyperactivity, this type refers to those emotions that grow rapidly by an unexpected shock and then when the arousal disappears, pleasure is relieved. Therefore, we can say that arousal levels play a key role in emotional changes (Wirtz et al., 2000).

Coming back to the topic, we can deduce that the touristic experience is special and complex (Rojas & Camarero, 2008), as there are many factors that take part in the process. Tourists soak up experiences through perceptions (visual, auditory, tactile, olfactory and taste), but the experiences can also be measured in other ways such as emotions, relationships, or cognitions (Uriely, 2005). Ritchie et al. (2011) remarked that the tourists' experiences are mainly psychological. As a further matter, Gnoth (1997), exposed that tourist motivation relies on the consumer's satisfaction with products and services. Moon and Han (2019) deducted that positive attitudes regarding a destination are related to the perception of quality and value in activities and the trip in general.

Subsequently, if travelers have favorable attitudes towards smart destinations, they might be inclined to use smart facilities and participate in activities (Moon and Han, 2019), as are more likely to have a satisfactory and significant experience when they participate in the process (Wang et al., 2020).

On the other hand, some scholars see the progression of technologies as doubtful (Hughes and Moscardo, 2019), they concur that although some do the job more efficiently, the tourism industry is people based, meaning that their satisfaction depends on the quality they have perceived of the service and products. They set as an example the current trend of self-check in hotels, where the staff is replaced by machines and the customer just pays, gets the key, and does not have any human interactions. These situations appear due to the high costs of training and its time consuming (Manyika et al., 2013). But the use of machines as a way of mediating the visitors' experience (Yetimoglu, 2022) can affect deeply on the traveler´s psychological wellbeing (Choi et al., 2022).

Hughes and Moscardo (2019) also pose the possibility that if technologies keep progressing, real travel and experiences might get replaced with augmented reality (AR) and Virtual reality (VR), we can see that as in lately some travel agencies started offering the possibility of experiencing in advance the trip through virtual reality as a way of sampling what their experience and trip will look like. This idea of using AR and VR can reduce some of the problems and challenges faced by the sector such as the containment of visitors in mass

tourism areas, but at the same time they could cause new challenges like the lack of visitors in certain places.

Other researches focus on the issues related to the lack of privacy perceived by the traveler itself (Buhalis, 2019), the distractions caused by some technologies such as mobile phones, which often prevent people from living the experience because they are submerged in the virtual world (Ayeh, 2018), which come in hand with alienation and the loss of authenticity exposed by Tribe and Mkono (2017). It is also important to note that while these negative aspects exist, they do not negate the overall positive impact of technology on the tourism industry. However, finding a balance and being mindful of these challenges is crucial for ensuring a positive and enriching travel experience.

Therefore, after all the research, the next three hypotheses are proposed:

Hypothesis 6: Smart tourism technologies can help personalize and customize your trip which leads to greater satisfaction of the tourist.

Smart tourism technologies have the potential to transform travel experiences by enabling personalized and customized trips. Hypothesis 6 posits that these technologies, through features such as AI-powered recommendations, real-time updates, and adaptive itineraries, significantly enhance tourist satisfaction. By analyzing user preferences, behavior, and past choices, these tools create tailored travel plans that align with individual interests and needs. Whether it's suggesting attractions, dining options, or activities, personalization ensures a more meaningful and relevant experience. This level of customization reduces the effort required to plan a trip and increases the likelihood of fulfilling travelers' expectations, resulting in greater satisfaction and a deeper connection to their journey.

Hypothesis 7: The adoption of smart tourism technologies significantly influences travelers by enhancing convenience, personalization and overall, the travel experience.

The adoption of smart tourism technologies plays a transformative role in shaping modern travel experiences. Hypothesis 7 suggests that these technologies significantly influence travelers by enhancing convenience, personalization, and the overall quality of their journeys. Tools such as mobile apps, AI-driven planners, and real-time navigation systems streamline travel logistics, making it easier to access information, book services, and navigate destinations. Meanwhile, personalization features allow travelers to curate experiences tailored to their preferences, interests, and needs, increasing satisfaction. By combining these advantages with interactive and engaging elements, smart technologies elevate the travel experience, making it smoother, more enjoyable, and memorable for travelers.

Hypothesis 8: There is a significant relationship between how smart tourism technologies are perceived and memorable tourism experiences.

Hypothesis 8 explores the connection between travelers' perceptions of smart tourism technologies and the memorability of their tourism experiences. The way these technologies are perceived—whether as user-friendly, innovative, reliable, or engaging—directly impacts how they shape travelers' journeys. Positive perceptions enhance a traveler's ability to access information effortlessly, enjoy personalized services, and engage with destinations in meaningful ways, contributing to a more memorable experience. Conversely, if technologies are seen as complex or unreliable, they may detract from the experience. This relationship highlights the importance of designing smart tourism tools that prioritize usability, efficiency, and emotional engagement to create lasting and impactful travel memories.

Through the investigation of other studies and quantitative research the goal is to confirm and support these hypotheses.

3. Methodology

This dissertation employs a quantitative research methodology, chosen to systematically investigate the relationship between smart tourism technologies (STTs) and tourists' behavior, particularly focusing on generational differences. The research aims to formulate hypothesis by collecting primary data through a structured online questionnaire. Quantitative research was deemed the most appropriate method for this study due to its ability to gather measurable, comparable data from a broad audience, allowing for statistical analysis and evaluation of hypothesis.

To collect the necessary data, I designed a self-administered questionnaire that was distributed to guests at The Newton Hostel, a popular hostel located in Madrid, during a three-week period in April 2024 (04/04/2024 – 23/04/2024). The selection of this hostel as the target is purposeful. Hostels typically attract a diverse, budget-conscious demographic, many of whom are highly aware of their environmental and cultural impact while traveling. This makes the hostel an ideal setting to investigate the generational use of STTs.

The survey was made available digitally by placing QR codes at the hostel reception. Guests were invited to scan the code with their smartphones, which directed them to the online questionnaire. This method ensured minimal intrusion while maximizing convenience for the respondents, who could complete the survey at their leisure. The voluntary nature of participation and the anonymous format allowed for a more comfortable and honest response from participants.

The questionnaire was divided into five key sections aimed at exploring various stages of the tourist journey and the perceived impact of STTs. It included two demographic questions and 39 Likert-scale items (rated from 1 = strongly disagree to 5 = strongly agree), organized into subtopics corresponding to the study’s hypotheses. The full questionnaire is available in Appendix 1.

- Demographic Information: The first section collected demographic data, including gender and age, to support Hypothesis 1 (Smart tourism technologies have more impact on younger generations) and Hypothesis 2 (Younger generations tend to use social media as a travel inspiration tool). These basic variables help segment the results based on generational cohorts, which is key to understanding differences in STT adoption.

- Customer Journey Map: The second, third, and fourth sections of the questionnaire were structured around the tourist's customer journey, consisting of three phases: prospective (before traveling), active (during the trip), and reflective (after the trip).

    1. Prospective Phase: Six items in this section focused on the use of STTs during trip planning and decision-making. Questions aimed to gauge how respondents use technologies like travel apps, websites, and social media for inspiration and information before embarking on a trip. This section directly relates to Hypothesis 3 (Smart tourism technologies enhance the prospective phase by offering tools and information, positively influencing travel decisions).

    2. Active Phase: The next section explored STT usage while at the destination, with 16 items addressing how technologies facilitate flexibility, convenience, and engagement during the trip. Respondents were asked about the usefulness of technologies such as GPS, real-time updates, and online booking systems while on-site. This section provides insights into Hypothesis 4 (Smart tourism technologies improve flexibility, convenience, and enjoyment, leading to a more memorable experience at tourist attractions).

    3. Reflective Phase: The final phase of the customer journey map featured seven items focused on tourists' reflections after their trip, particularly the role of STTs in sharing experiences, reviewing destinations, and evaluating their overall satisfaction. This part helps confirm Hypothesis 5 (Smart tourism technologies positively impact the reflective phase by offering platforms for sharing experiences, thereby contributing to a memorable trip).

- Satisfaction and Revisit Intention: The last section, consisting of 10 items (questions 30 to 39), assessed overall satisfaction and the likelihood of revisiting a destination. Questions here were designed to evaluate how STTs enhance personalization, satisfaction, and the likelihood of returning to a destination. The responses help validate Hypothesis 6 (Smart tourism technologies can personalize trips, leading to greater satisfaction), Hypothesis 7 (The adoption of smart technologies enhances convenience and personalization), and Hypothesis 8 (There is a significant relationship between how STTs are perceived and a memorable tourism experience).

After the data collection phase, the responses were exported from the survey platform and prepared for analysis. Descriptive statistics were calculated to summarize the general trends in the data, while inferential statistics were applied to test the hypotheses. The Likert scale data were analyzed to explore the relationships between STT usage and variables such as

age, travel phase, and satisfaction. Regression analysis was also employed to determine the extent to which STT usage predicts tourist satisfaction and revisit intention.

The goal of the analysis was to determine whether generational differences exist in STT adoption and to assess the impact of these technologies across the customer journey map.

While the study provides valuable insights, there are a few limitations to note. The focus on one hostel may limit the generalizability of the findings to other types of accommodations or geographical areas. Furthermore, most respondents belonged to younger generations, which may skew the data towards the preferences of Generations Y and Z, potentially underrepresenting the views of older travelers. Finally, the self-reported nature of the data may introduce response biases, such as social desirability or self-selection bias.

This methodology chapter has outlined the quantitative approach taken to investigate the relationship between generational differences and the use of smart tourism technologies. By targeting tourists in a hostel environment, the study aimed to capture the behaviors of travelers, who are typically more adept at using technology, while also gathering data on generations for comparative purposes.

4. Results

The questionnaire was answered by 200 people who stayed on the “2060 The Newton Hostel”, in Madrid during the laps of three weeks from the fourth of April 2024, till the twenty third of April.

Out of the 200 responders, 129 respondents were females, 71 males. Regarding the ages 58 respondents were between the ages eighteen and twenty-four, 60 between the ages twenty-five to thirty-four, 21 between thirty-five to forty-four, 26 between forty-five and fifty-four, 20 between fifty-five and sixty-four and finally 15 over 65 years. At the same time, these ages refer to different generations, generation Z would be the ones between 18 and 24, millennials or generation Y are the ones from 25 to 44 years, those between the ages 45 to late 50s belong to generation X, and baby boomers the ones over 60. Differentiating the ages of the travelers has given me the possibility of observing the different uses given to Smart tourism technologies depending on the generations, although we cannot generalize the result as just a few people from each generation answered the questionnaire.

Table 4: Demographic

Sex/gender	Nº respondents	% respondents
Female	129 respondents	64.5%
Male	71 respondents	35.5%

Source: Own elaboration

Table 5: Age and generation of respondents

Age	Nº respondents	% respondents	Generation
18 - 24	58 respondents	29%	Generation Z
25 - 34	60 respondents	30%	Generation Z/ Generation Y
35 - 44	21 respondents	10.5%	Generation Y or millennials
45 - 54	26 respondents	13%	Generation X
55 - 64	20 respondents	10%	Generation X/ Baby Boomers
+ 65	15 respondents	7.5%	Baby boomers

Source: Own elaboration.

4.1 Prospective phase

The first section of the questionnaire, which is formed by 6 items, aims to find an answer to hypothesis 3, related to the active phase. The graphs represent the number of respondents who voted for each level of agreement or disagreement.

As It is pointed out before, we live in a world where technologies have become an everyday tool, from the younger generations to the older ones, as we can see from the response in item 1: “I use STTs to search and plan my trips”, 100 respondents totally agreed, 65 slightly agreed, 18 were neutral responses, 8 slightly disagree and 9 totally disagreed (Figure 1).

Overall, the results reveal a generational trend in the adoption of STTs for trip planning, younger generations, particularly those ages 18-24 and 25-34, show the highest levels of agreement with these technologies, while older generations demonstrate lower levels of agreement and higher rates of neutrality or disagreement. These findings highlight the influence of generational differences on technology adoption, aligning with previous research that identifies younger travelers as more likely to integrate digital tools into their travel routines. We can back this up with the response to Figure 2 “The usage of STTs increases my interest in certain destinations/ activities” (70 totally agree, 74 slightly agree, 30 neutral, 17 slightly disagree and 9 totally disagree) (Figure 2).

The data reveals a clear generational divide in the influence of STTs on travel interest. Younger generations (18–34) display the highest levels of agreement, indicating that STTs play a significant role in increasing their interest in destinations and activities. This could be attributed to their frequent use of visually engaging platforms such as Instagram and TikTok, where STTs are often integrated.

In contrast, older generations, particularly those aged 55 and above, exhibit more neutral or negative responses, reflecting a lesser reliance on or trust in digital tools for travel inspiration. The findings suggest that while STTs are effective at engaging younger travelers, their impact diminishes with age, underscoring the importance of tailoring technological solutions to different generational needs and preferences.

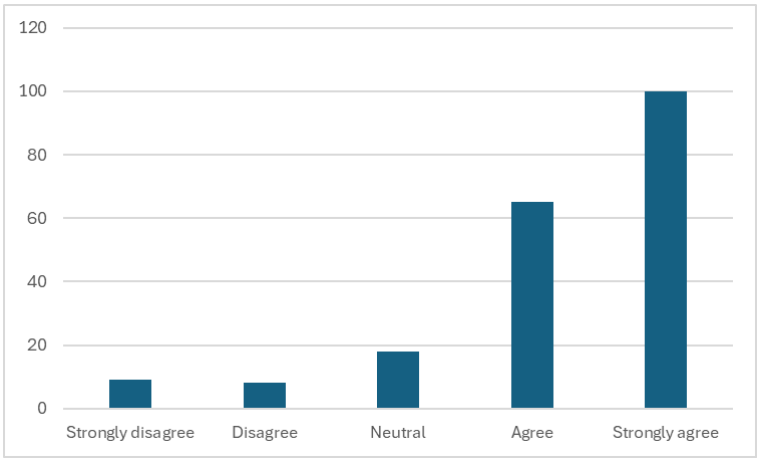

Figure 1: I use STTs to search and plan my trips.

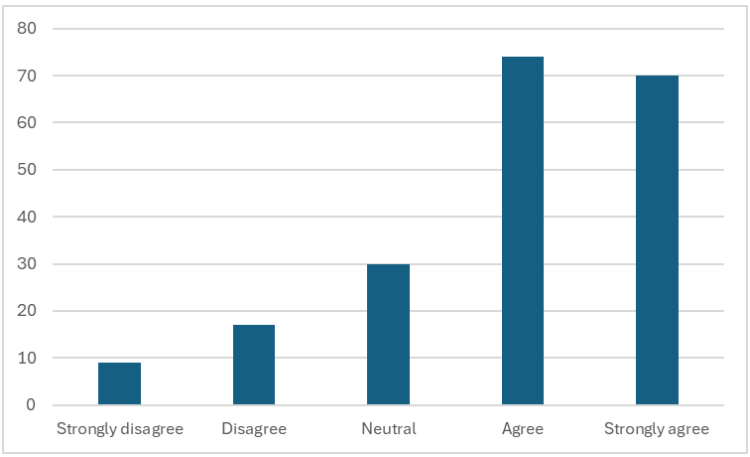

Figure 2: STTs increase interest in certain destinations.

The third statement or item made the respondents reflect about if STTs help them reduce decision risks, to which most of them agreed and just over one third were either neutral or in disagreement, 76 totally agreed, 74 slightly agreed, 33 answered neutrally, 8 slightly disagreed and 9 totally disagreed (Figure 3).

The data reveals a clear generational divide in the perceived effectiveness of STTs in reducing decision risks. Younger generations (18–34) express the highest levels of agreement, underscoring their trust in STTs for features like user reviews, recommendations, and detailed information that help them make informed travel decisions.

In contrast, older generations, particularly those aged 55 and above, exhibit more neutral or negative responses, reflecting either a lack of reliance on STTs or limited confidence in their accuracy and reliability. The findings suggest that while STTs are seen as valuable tools by younger travelers, their adoption and perceived usefulness decline among older age groups,

pointing to the need for targeted strategies to address the preferences and concerns of different demographics.

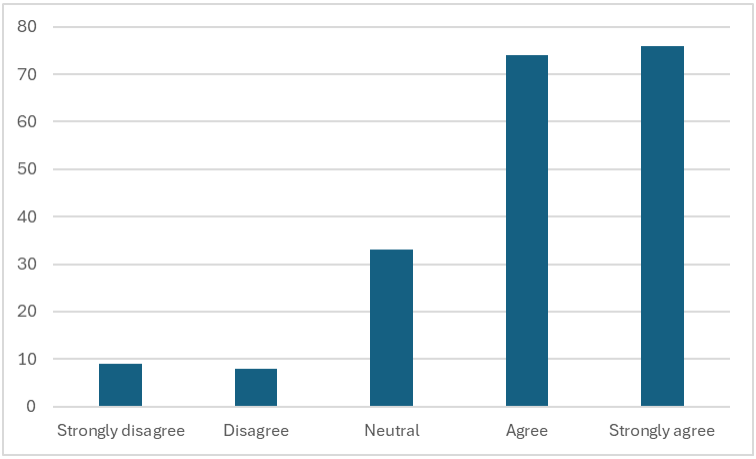

Figure 3: STTs help reducing risks.

As a consequence of globalization, people travel more which leads to a more connected world in which we can obtain information about cultures and destinations easier. On the fourth item, respondents were asked to rate if STTs can help them build a better understanding of local culture, where we can see again how the older generation again answered in disagreement, but overall, most of the responses where positive, 50 were totally in agreement, 69 slightly agreed, 44 were neutral, 26 slightly disagreed and 11 totally disagreed (Figure 4).

The data shows a clear generational divide in how respondents perceive the role of STTs in building cultural understanding. Younger groups (18–34) tend to agree more strongly with the statement, viewing STTs as tools that provide access to information, local insights, and multimedia content to understand destinations.

Older generations, particularly those over 55, are more neutral or skeptical, with some expressing outright disagreement. This trend could stem from a combination of lower technological engagement and a preference for traditional cultural immersion methods, such as direct interaction with locals or reliance on physical guides.

The findings suggest that while STTs hold potential as a resource for cultural understanding, there is a need to improve their accessibility and relevance to older travelers to bridge the generational gap in adoption and trust.

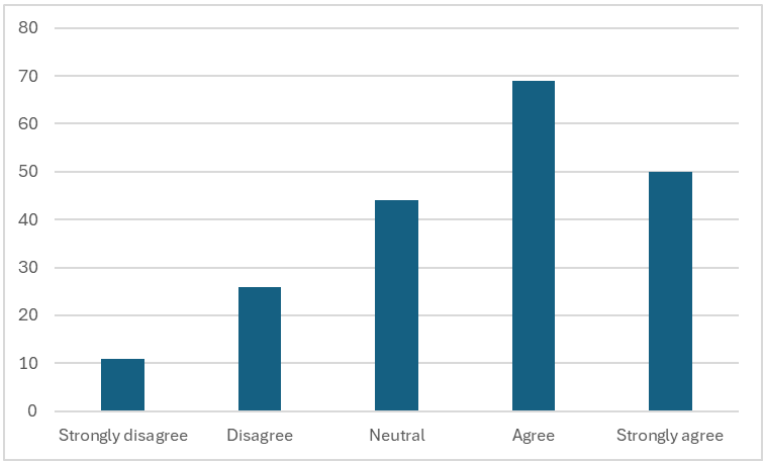

Figure 4: SSTs help me understand local culture.

On Item 5, the subject of AI tour applications is brought up, to which most of the respondents answered neutrally as it is still very unknown, but were the millennials the ones that agreed with the statement, and the baby boomers the ones that strongly disagreed with it, the overall answers to this question were 22 in total agreement, 44 slightly agreed, 82 were neutral responses, 37 respondents slightly disagreed and 15 totally disagreed with it (Figure 5).

The responses reveal a generational division in attitudes toward AI's impact on travel decision-making. Younger age groups (18–34) show a moderate level of agreement, reflecting their familiarity with digital tools and openness to new technologies. However, neutrality remains high even among younger respondents, indicating a level of uncertainty about AI's specific benefits in tourism applications.

In contrast, older age groups (35 and above) are more likely to respond neutrally or negatively, suggesting either a lack of engagement with AI-based tools or skepticism about their utility. These findings point to the need for greater awareness and targeted user education to improve the adoption of AI in tourism, especially among older travelers.

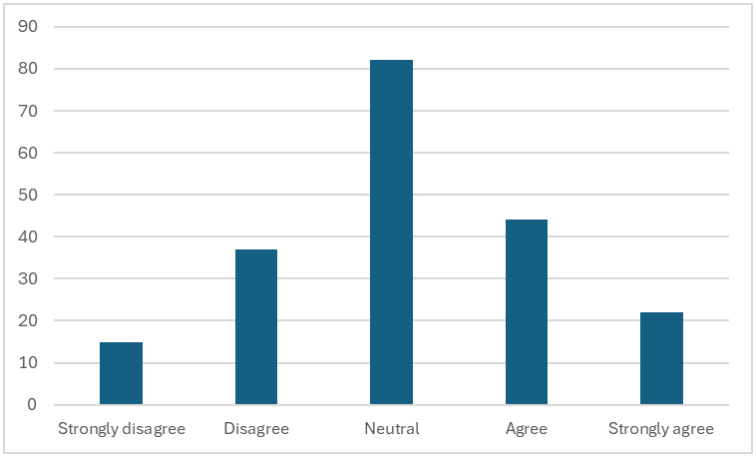

Figure 5: AI positively influences my decisions.

The difference between generations can clearly be seen on the response of item 6, about the use of social media for recommendations, 64 respondents totally agreed with the statement, 34 slightly agreed, these were the generation Z and millennials, from the 52 neutral responses most of them come from generation X, the ones in disagreement were generation X and boomers, 20 slightly disagree and 30 totally disagreed (Figure 6).

The data underscores generational division in the frequency of social media use for travel-related purposes. Younger respondents (18–34) are more likely to utilize these platforms to seek recommendations and research destinations, with Generation Z being the most active users. This aligns with their reliance on visual and interactive digital tools for inspiration and planning.

Conversely, older age groups (45 and above) demonstrate much lower engagement, with neutrality and disagreement dominating their responses. This suggests that traditional methods of travel research, such as guidebooks, personal recommendations, or direct website visits, may still hold more sway for these groups.

The findings highlight the growing importance of social media in shaping travel decisions among younger generations while underscoring the need for more targeted outreach to engage older travelers through other channels.

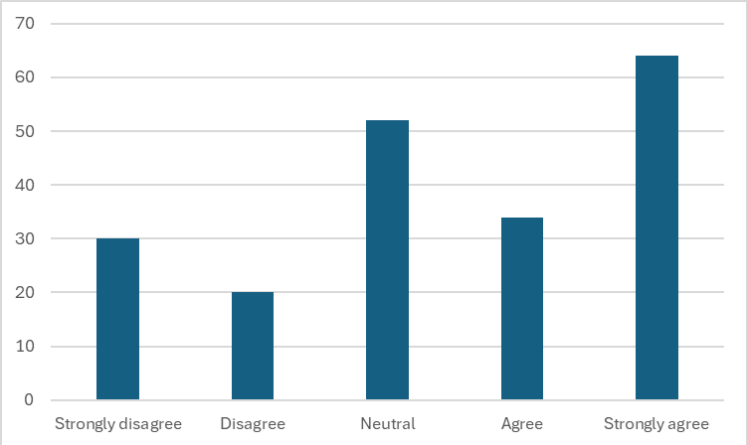

Figure 6: I use social media for research.

By analyzing these six items we can support and verify hypothesis 3: “Smart tourism technologies enhance the prospective phase by offering tools and information, thereby positively influencing their travel decisions”. As Lan et al. (2021) said before leaving for a destination, tourists make different consultations, Platov et al. (2021) added that tourists tend to self-educate themselves by investigating about the culture and history of an area with the aim of being as respectful as possible.

Looking at the answers to the questionnaire we can see that most people use some sort of technology whether it is to organize their trip or to get inspiration about the places that they should visit during their trip. As we live in an era ruled by the internet and social media, all kinds of information can be found online and in different forms, older people tend to do their research by visiting the destinations web and by reading online blogs, on the other hand younger generations tend to look for that information on social medias like TikTok or YouTube where they can visualize and get an idea of what the will be experiencing and will be consuming.

When making reservations for accommodations, flights and activities, in the past many agencies were used as intermediaries, these would create the entire itinerary for you, without you having to worry. But currently with the large number of webpages like Skyscanner, Kayak, Booking or Expedia, that give you the opportunity to organize a trip in a more flexible way, they analyze the different offers and prices from the different companies so you can choose the cheapest option or the one that best suits the itinerary you want.

Another topic that was touched on in the survey was decision risks, as we can see most of the respondents said that they feel more comfortable when they investigate or use STTs as they can look for comments, ratings and reviews left by previous travelers. Not only that, but technologies can help them obtain health related information, make secure transactions, or look at real-time alerts, as well as research about travel insurance.

4.2 Active phase

Through the second section of the questionnaire, formed by 16 items, we question hypothesis 4, analyzing how STTs affect the tourist during the active part of their travels, in other words, during the trip.

On the seventh item, respondents were asked to rate on what degree does social media helps them shape their aspirations on their trips, to which 47 totally agreed, 54 slightly agreed, 44 were neutral answers, 35 slightly disagreed with the statement and 20 totally disagreed (Figure 7).

The findings reveal a clear generational divide in the perceived role of social media in shaping travel aspirations. Younger respondents (18–34) overwhelmingly agree that social media plays a significant role, reflecting its prominence in their daily lives and its ability to influence their desires visually and interactively.

In contrast, older respondents (45 and above) demonstrate a notable decline in agreement, with neutrality and disagreement dominating their responses. These groups may rely on

traditional sources such as personal recommendations, travel agencies, or guidebooks for travel inspiration.

The results underscore the importance of tailoring marketing strategies and travel content to resonate with younger audiences on social media, while leveraging alternative methods to engage older demographics.

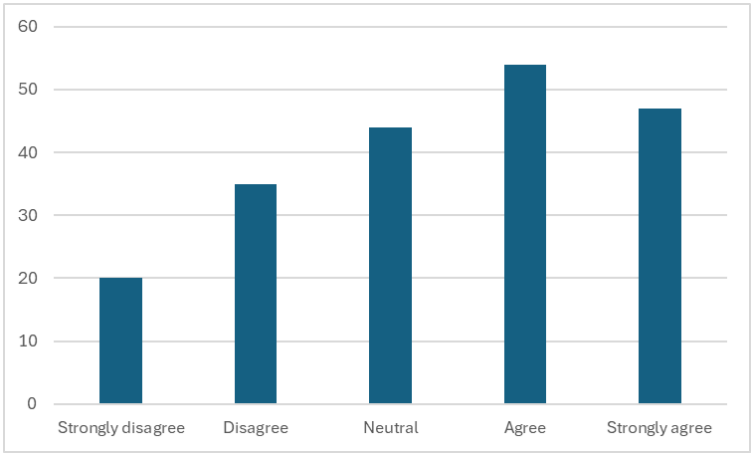

Figure 7: Social medias are significant for shaping my trip.

The same happens on the next item, where they were asked if social media enhances their travel experiences, half of the answers were positive, 34 totally agreed, 75 slightly agreed, a quarter of the responses were neutral (42), and the other remaining quarter responded in disagreement, 38 slightly disagreed, and 11 totally disagreed (Figure 8).

The data suggests a clear generational divide in the perception of social media's role in enhancing travel experiences. Younger respondents, particularly those in the 18-24 and 25-34 age groups, overwhelmingly view social media as a positive tool for connecting with locals and sharing experiences. In contrast, older age groups, particularly those aged 55 and above, are more skeptical, with significant portions of respondents either neutral or disagreeing with the statement. These trends underscore the growing importance of social media for younger travelers, while older generations may still prefer traditional methods of travel interaction and experience sharing.

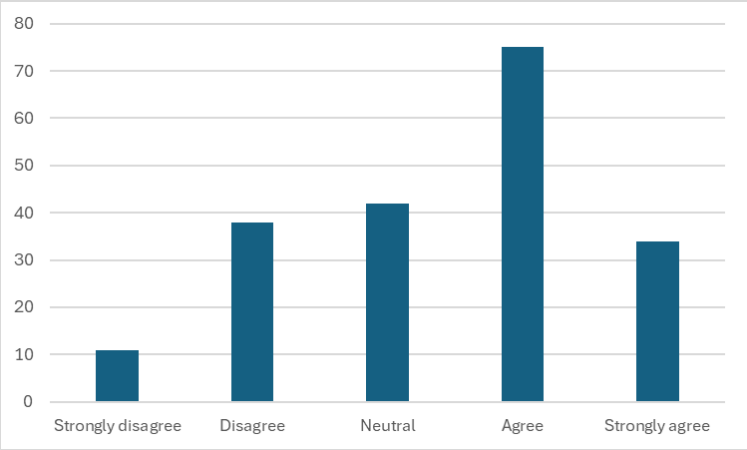

Figure 8: Social media enhances my travel experience.

In item number 9, respondents were asked about real time information sharing through social media via, like sharing the location on their Instagram stories while on site, to which, although most of the responses were in agreement (16 totally agreed, 74 slightly agreed), there is still a significant number of people who either were in disagreement (35 slightly disagreed, 21 totally disagreed) or answered neutrally (54 respondents) (Figure 9).

The survey results clearly indicate that younger age groups (18-34) are more influenced by real-time information when traveling, as seen in the higher levels of agreement with the statement. Social media platforms and other sources of real-time data such as alerts, updates, and location-based services are particularly impactful for these groups, likely due to their frequent use of technology and online platforms for travel-related decisions.

Conversely, older respondents (45+) show less reliance on real-time information, with many either neutral or disagreeing with its influence on their travel behavior. This trend suggests that older generations may rely more on traditional sources of information and planning and may not be as accustomed to real-time updates shaping their travel choices.

These findings underscore the importance of understanding generational preferences when developing travel applications and marketing strategies. For younger travelers, the integration of real-time updates could enhance their travel experience, whereas older travelers may benefit from a more traditional approach to travel information.

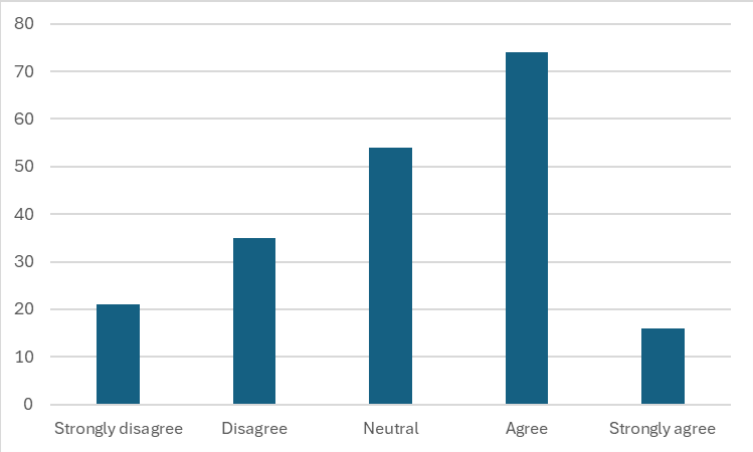

Figure 9: Real-time information sharing impacts my trips.

On items 10 and 11, we can see the similarity of the answers, not just on the answers depending on the generation, but on the number of people who agreed and disagreed on them. On the first one the statement that they needed to rate was how smart tourism technologies facilitate navigation and communication while traveling, as they have become a key element in our daily life. As I expected most of the responses were positive, 90 respondents totally agreed, 68 slightly agreed, 34 responses were neutral, 3 slightly disagreed and 5 totally disagreed (Figure 10).

The results show a clear generational divide in the perception of smart tourism technologies as tools for navigation and communication. Younger travelers, particularly those in the 18-34 age range, strongly agree that these technologies play a key role in enhancing their travel experience. This trend is likely driven by the frequent use of smartphones, apps, and online platforms for real-time navigation, communication, and coordination during trips.

In contrast, older travelers (45 and above) exhibited a more moderate to low level of agreement, with many respondents neutral or slightly disagreeing with the statement. This suggests that while they may still recognize the usefulness of smart technologies, they may not rely on them as extensively or may prefer traditional methods for navigation and communication, such as physical maps or face-to-face interactions.

These findings indicate the importance of catering to different generational needs when designing and marketing smart tourism technologies. Younger travelers may benefit from apps and digital services that offer seamless navigation and communication, while older travelers may need simpler, more intuitive tools or rely on conventional methods.

In relation to it, next they were asked about the reliance of location-based services (Figure 11), the answers being very similar as 115 totally agreed, 55 slightly agreed, 22 were neutral, 4 slightly disagreed and other 4 totally disagreed.

The survey results clearly indicate that younger age groups (18-34) rely much more heavily on location-based services during their travels compared to older age groups. This trend is consistent with the general increase in digital engagement among younger generations, who are more accustomed to using smartphones and apps to facilitate their daily lives, including travel.

In contrast, older travelers (45 and above) exhibited more moderate to low levels of reliance on these services, with many indicating neutral or slightly disagreeing responses. This could be due to less frequent use of digital tools for navigation or a preference for alternative methods of travel planning and on-site assistance.

These findings emphasize the importance of tailoring location-based services to different generational needs. Younger travelers may expect seamless, app-driven experiences, while older travelers might prefer options that incorporate more traditional, user-friendly tools. Ensuring that these services are accessible and intuitive for all age groups can help maximize their effectiveness in enhancing the travel experience.

On item 12, they had to rate if they agreed that location based services give the ability to explore and discover, the on this item a few more of the respondents disagreed (16 slightly disagreed, and 4 totally disagreed), at the same time we can still see that the majority of the respondents agreed on it, 79 totally agreed and 61 slightly agreed, out of all the answers just 39 were neutral (Figure 12).

The results indicate a clear generational divide in the perceived impact of location-based services on destination discovery. Younger travelers (18-34) show strong agreement, with many acknowledging the significant role of LBS in enhancing their ability to explore new places. These findings align with the high digital engagement of younger generations, who are more likely to use smartphones and apps to enhance their travel experiences.

In contrast, older age groups (45 and above) demonstrate more neutral to slightly negative opinions about the usefulness of LBS in destination exploration. While some appreciate technology, others are less reliant on it or may prefer more traditional forms of travel exploration, such as guidebooks or local recommendations.

This highlights the need for tourism technologies to be adaptable to different generational preferences, ensuring that location-based services are accessible and valuable to a wide

range of travelers. Understanding these generational differences can help developers and tourism providers tailor their offerings to better meet the needs of various age groups.

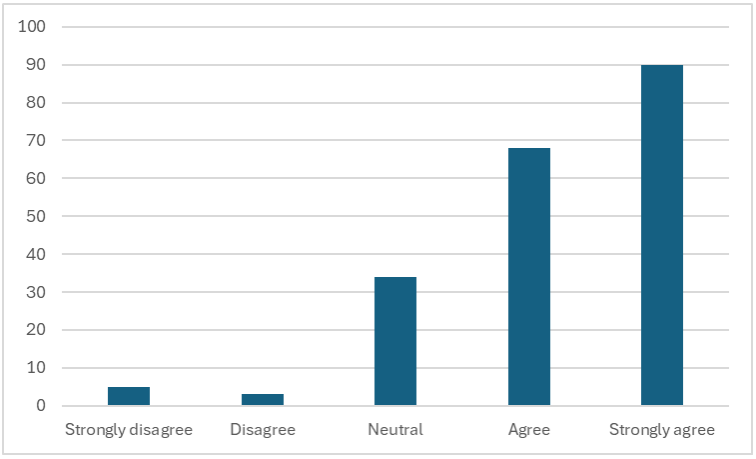

Figure 10: STTs facilitate navigation.

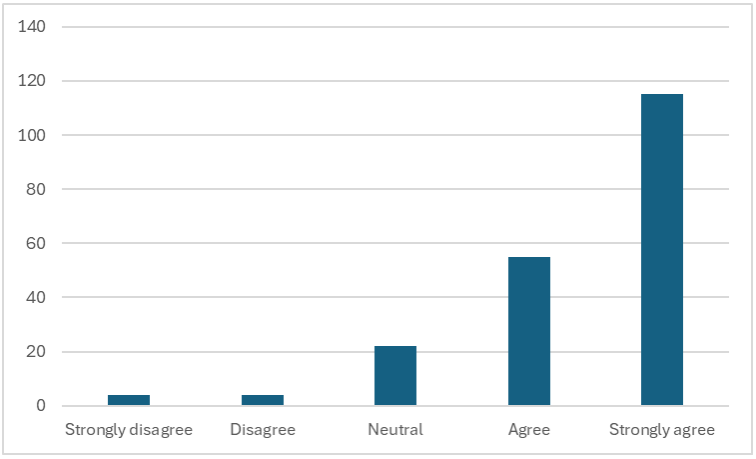

Figure 11: I relay in location-based services.

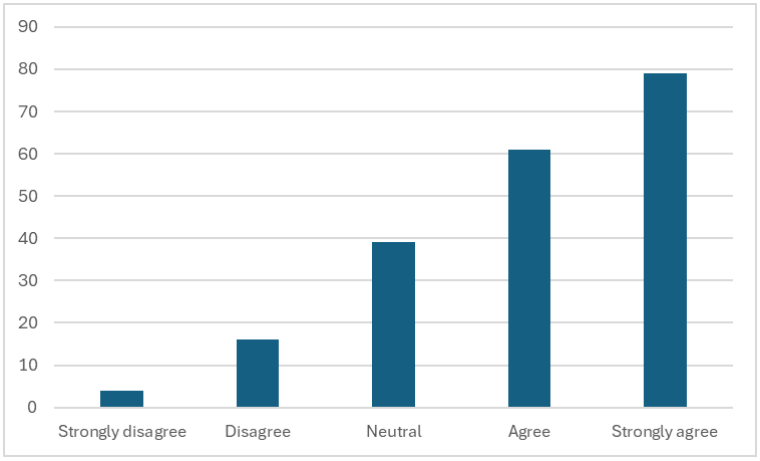

Figure 12: Location based services improve my ability to explore.

The latest news on the hotel sector has been replacing the real staff with AI machines where you can directly check in without the necessity of a person. On the thirteenth item respondents were asked to consider their opinion on how convenient smart hotel features like this one are. The answers were a lot more positive than I expected, 58 totally agreed, 64 slightly agreed, 42 responses were neutral, 29 slightly disagreed and 7 totally disagreed (Figure 13).

The results demonstrate a clear generational divide regarding the convenience of smart hotel features. Younger travelers (18-34) show the highest levels of agreement, highlighting their comfort with digital tools and preference for technology-driven conveniences. In contrast, older travelers (45+) exhibit more mixed or negative opinions, with many expressing neutrality or slight disagreement, indicating that they may not find these features as essential or convenient.

These differences may be attributed to varying levels of digital literacy, familiarity with technology, and preferences for more traditional, personal interactions in the travel and hotel context. As such, hotel providers should consider offering flexible options that cater to different age groups, ensuring that both tech-savvy and more traditional travelers feel comfortable and well-served during their stays.

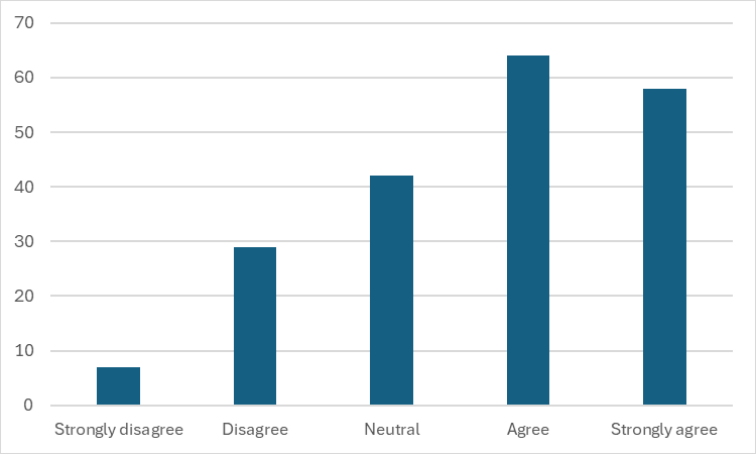

Figure 13: I find smart hotel features convenient.

The main goal of these kind of features and technologies is to speed the process, which bring us to item fourteenth, the intention of this statement was to figure out if people thought that smart tourism technologies enhance convenience and speed, 55 respondents totally agreed, 90 slightly agreed, 37 responses were neutral, 13 slightly disagreed and 5 totally disagreed (Figure 14).

The results clearly show that younger travelers (18-34 years) are the most enthusiastic about the role of smart tourism technologies in improving convenience and speed while traveling.

These age groups have grown up with technology and are more likely to embrace its integration into every aspect of their travel experience. Conversely, older travelers (45 and above) appear more divided in their opinions, with many showing either neutrality or mild disagreement, reflecting a preference for more traditional methods or a lack of familiarity with new travel technologies.

This trend highlights the importance of providing flexible options to accommodate travelers of different ages and technological comfort levels. While younger travelers may prioritize technology, older generations may prefer a more personal or hands-on approach when navigating destinations.

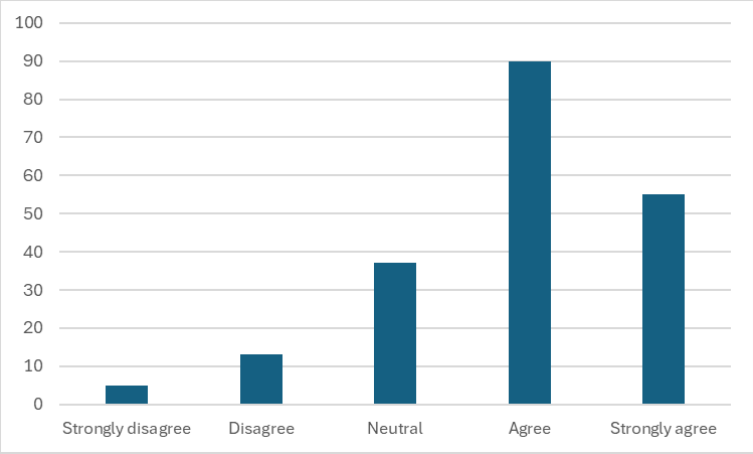

Figure 14: STTs enhance convenience.

On the same topic, the fifteenth item made them reflect on whether STTs helped them make short term decisions, out of all responses the majority were clearly positive, 59 totally agreed and 74 slightly agreed, less than a quarter responded neutrally (42), and an eighth answered in disagreement, 19 slightly disagreed and 6 totally disagreed (Figure 15).

The results clearly show that younger travelers (18-34 years) are the most enthusiastic about the role of smart tourism technologies in improving convenience and speed while traveling. These age groups have grown up with technology and are more likely to embrace its integration into every aspect of their travel experience. Conversely, older travelers (45 and above) appear more divided in their opinions, with many showing either neutrality or mild disagreement, reflecting a preference for more traditional methods or a lack of familiarity with new travel technologies.

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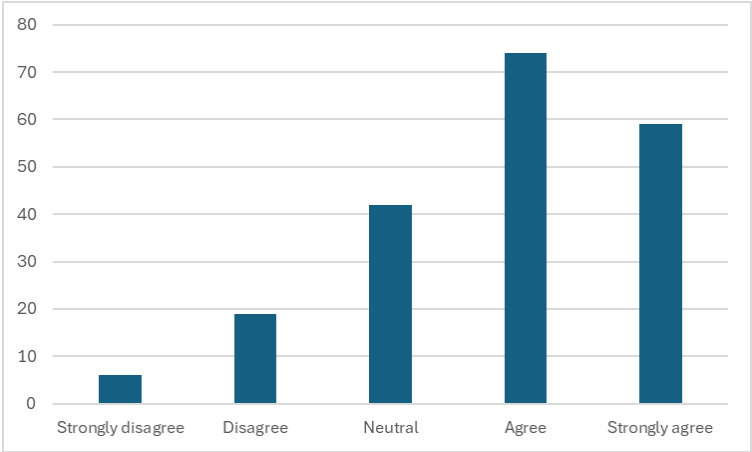

Figure 15: STTs help me make short term decisions on destination.

Another key aspect of smart tourism technologies is flexibility, as lately if has become essential for the younger generations, on item sixteenth respondents were asked to assess their thoughts on the flexibility provided by STTs, to which 54 totally agreed, 78 slightly agreed, 50 answered neutrally, and only 11 respondents slightly disagreed and 7 totally disagreed (Figure 16).

Overall, the survey results show a strong generational divide in how travelers perceive the impact of smart tourism technologies on flexibility, engagement, and enjoyment during their travels. Younger age groups (18-34 years) exhibit an elevated level of agreement, indicating that they find these technologies to be essential in improving their travel experiences. They likely value the ease of use and the ability to personalize their travel choices in real time.

In contrast, older age groups (45 years and above) show more mixed reactions, with a larger proportion remaining neutral or disagreeing. This suggests that while there is some acknowledgment of the advantages of smart tourism technologies, these age groups may not rely on them as heavily, due to lower familiarity or comfort with digital tools.

This divide underscores the importance of tailoring smart tourism solutions to different age groups, ensuring that technologies are accessible and beneficial for travelers across all generations.

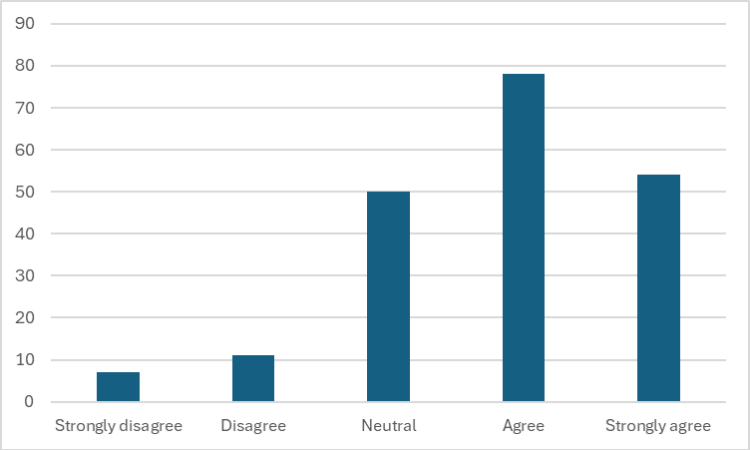

Figure 16: STTs enhance flexibility on destination.

The form of payment has completely changed over the last twenty years, one of the latest forms is smart payment, using different IoTs like smart watches or smartphones to pay, without the need of carrying a credit card all the time. On item seventeen I focused on the tourist's perspective of it, the main response was totally in agreement with 76 votes, then slightly agreed with 67 responses, 42 travelers voted neutrally, 12 slightly disagreed and 13 totally disagreed (Figure 17). Overall, the answers were a lot more positive than I expected, mainly on the older generation.

Younger travelers (ages 18-34) express the strongest agreement, with a significant portion totally agreeing that digital wallets enhance their travel experience by simplifying financial transactions. This aligns with the growing trend of cashless payments among younger generations who are more accustomed to using mobile technology for everyday tasks.

In contrast, older age groups (45 years and above) show a more cautious approach. While many acknowledge the convenience of digital payment systems, there is a higher proportion of neutral or disagreeing responses, especially in the 55-64 and over-65 age groups. This may reflect less familiarity with or trust in digital payment tools, as well as a preference for traditional methods of managing finances.

These findings highlight the need for smart tourism technologies to consider the varying levels of adoption across generations, with younger travelers being more open to embracing cashless payment methods, while older generations may require additional education or incentives to fully integrate these technologies into their travel routines.

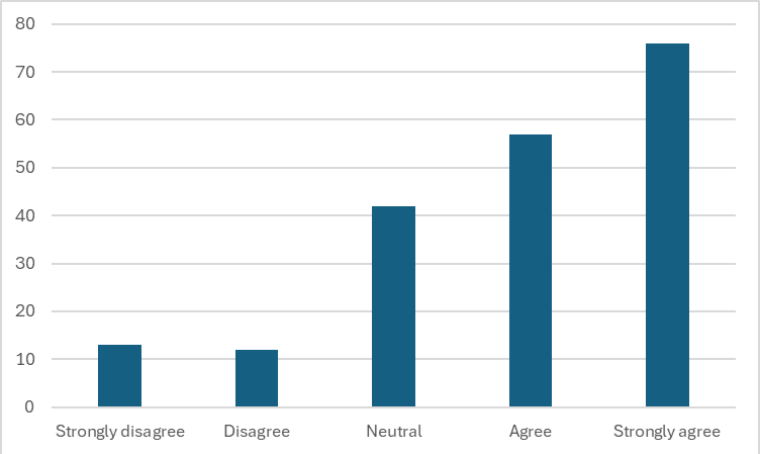

Figure 17: Smart payment systems are convenient.

On the next item, real time translation apps and webs are brought up. The fact that we live in a world where we can access any place, we want without any difficulties has led to a clash of cultures where people from different backgrounds interact, for that technologies like real time translation apps have been created, with the aim of hurrying the process, and let people communicate easier. Overall, the responses were quite positive, 64 highly agreed, another 64 slightly agreed, 49 responses were neutral, 14 slightly disagreed and 9 totally disagreed (Figure 18).

Overall, younger age groups (18-34) show strong enthusiasm for real-time translation services, with a significant portion agreeing that these tools improve communication during travel. This suggests that younger generations are more comfortable with technology and value its role in overcoming language barriers.

In contrast, older age groups (45+) show less pronounced agreement, with many respondents remaining neutral or slightly disagreeing. This reflects a more conservative approach to new technology, as these groups may not rely as heavily on digital tools for communication and may have different preferences or expectations when traveling.

The results indicate that while real-time translation services are seen as helpful, there is a clear generational divide in their perceived effectiveness. Younger travelers, particularly those aged 18-34, are more likely to embrace such services, while older travelers may need more encouragement or education to fully incorporate these technologies into their travel experience.

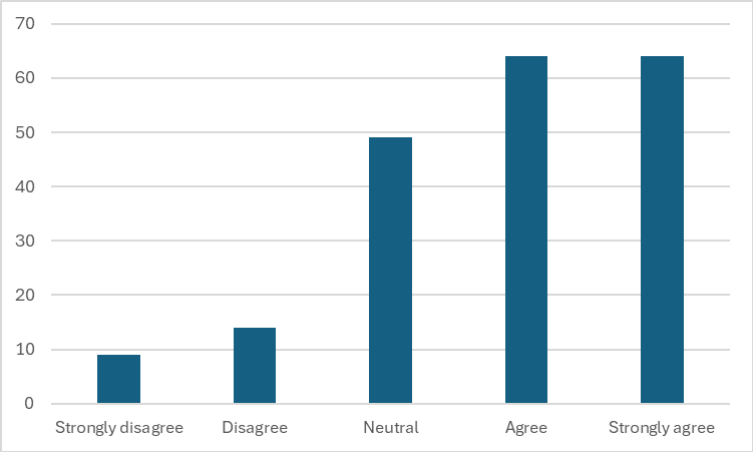

Figure 18: Real-time translation services improve communication.

One of the most unknown aspects of STTs, is the usage of AR or VR, not a lot of people know about the usage of virtual reality to promote destinations, but in the sector it is becoming essential as it allows destinations and businesses to create a video or an experience in which the customer can experience the service and enhance their engagement. As it was expected, due to the lack of knowledge of these tools, the main responses were negative, over a quarter completely disagreed (52), and nearly another quarter slightly disagreed (46), as well as neutral responses (46), and just 35 said that they agreed and 19 that they highly agreed (Figure 19).

The survey results suggest that while AR and VR have potential in tourism, their adoption and perceived benefits are limited. Younger groups (18-34) show some interest but are divided, with many skeptical or uninterested in how these technologies enhance engagement with destinations. The older age groups (45+) show even less enthusiasm, with a clear preference for more conventional experiences when traveling.

The relatively high levels of disagreement, especially in the 55+ groups, indicate that AR/VR is not yet seen as a vital tool in tourism by most travelers. These technologies may have niche appeal but are far from being universally embraced by the broader population. Future tourism strategies might need to focus on creating more accessible, user-friendly experiences to increase engagement and acceptance of AR and VR in travel.

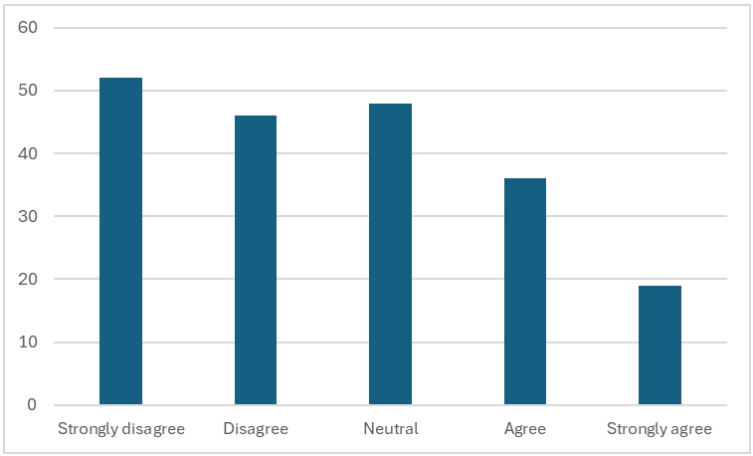

Figure 19: AR and VR enhance my engagement.

Another of the most controversial topics is if these smart technologies and destination management systems on a destination contribute to the safely and security on destination, there was almost an even number of respondents who said that they slightly agreed (67) and voted neutrally (64), only 33 highly agreed, over 28 that the slightly disagreed and 8 that they totally disagreed (Figure 20).

The survey results reveal that younger age groups (18-34) show the strongest support for the idea that smart destination management systems enhance the safety and security of tourists. These groups appear more comfortable with technology and likely recognize the value of systems that could improve their travel experiences.

Older age groups (45+), however, are more cautious. While some respondents agree that smart systems can contribute to safety, a considerable number remains neutral or disagrees. This may reflect a greater preference for traditional forms of security, or it could be related to unfamiliarity with or skepticism about the effectiveness of such technologies.

Overall, there is a general consensus among younger generations that smart destination management systems are beneficial for safety, though the level of agreement decreases as age increases. The findings suggest that as digital technologies become more integrated into tourism, younger travelers are more likely to embrace these innovations.

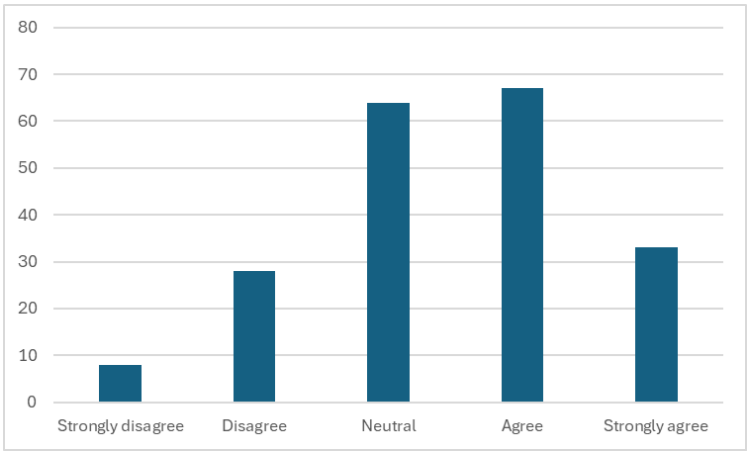

Figure 20: STTs contribute to safety and security.

the last two items on this part of the questionnaire were consecutively about smart transportation systems and its impact, on the first one the travelers were asked if it contributed to stress free travel, as its main goal is to improve their travel, to which 82 responded that they slightly agreed, 42 that they highly agreed, 49 were neutral, 17 slightly disagree and 10 completely disagreed (Figure 21).

Younger respondents (18-34) show a strong preference for smart transportation systems, viewing them as key contributors to stress-free travel. The 35-44 group holds more moderate views, while older age groups (45 and over) demonstrate a greater level of skepticism or indifference. The survey suggests that younger generations are more open to embracing smart technologies for travel, while older generations may not fully recognize or appreciate their benefits.

For businesses and destinations aiming to cater to a wide range of age groups, the results imply that younger travelers will be more responsive to smart transportation innovations, while older travelers may require more education or reassurance about the benefits these systems offer.

And on item 22, about the impact they produce, mainly all of them agreed with the statement, 64 totally agreed, 61 slightly agreed, 51 answered neutrally, 16 slightly disagreed and 8 totally disagreed (Figure 22).

Younger respondents (18-34) strongly believe that smart transportation options such as ride-sharing apps and real-time transit information enhance their travel experiences. Over half of individuals in these groups either totally or slightly agreed with the statement. However, older respondents (45 and over) express less enthusiasm, with a more significant proportion of neutral or disagreeing answers.

Younger travelers tend to view smart transportation options as a critical component of a positive travel experience, while older groups are more cautious or indifferent about their effectiveness. For travel and tourism businesses, these results suggest that incorporating smart transportation options is more likely to appeal to younger generations, while older travelers might require additional information or encouragement to fully embrace these technologies.

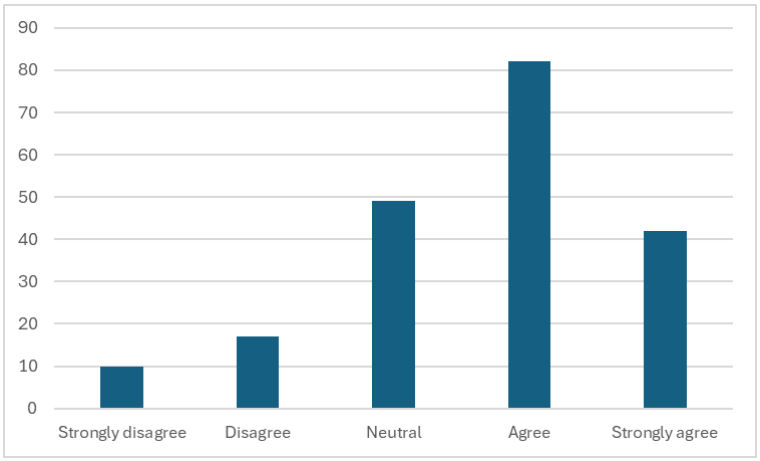

Figure 21: Smart transport contributes to no stress.

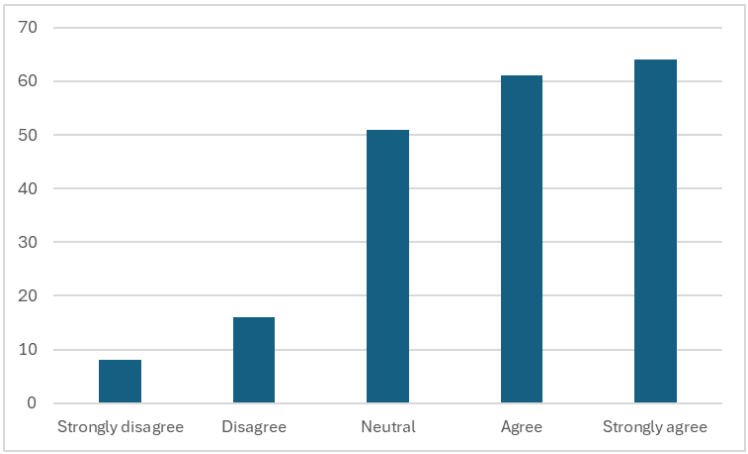

Figure 22: Smart transport impacts positively on experience.

After looking at the answers, we can confirm hypothesis 4 “Smart tourism technologies improve flexibility, provide convenience and speed, and facilitate engagement and enjoyment, resulting in a more attractive and memorable experience at tourist attractions”.

Smart tourism technologies have a transformative impact on the active phase of the customer journey, greatly enhancing the visitor experience at tourist attractions. These technologies

significantly improve flexibility, convenience, speed, engagement, and enjoyment, ultimately making visits more attractive and memorable.

STTs provide tourists with the flexibility needed to optimize their visit. Real-time information updates though mobile apps and websites offer critical details about weather conditions, crowd levels, and event timings, allowing visitors to adjust their plans on the go. Navigation apps with GPS capabilities help tourists find the quickest routes, avoid traffic, and explore nearby attractions spontaneously.

Moreover, AI-driven personalized recommendations adapt to the visitors' preferences and behaviors, suggesting tailored itineraries, dining options, and activities. This adaptability ensures that tourists can modify their plan to suit their changing interests and circumstances, enhancing the overall flexibility of their visit.

The convenience offered by smart technologies significantly enhances the tourist experience. Mobile payment systems and digital wallets enable quick and secure transactions at attractions, restaurants, and shops, eliminating the need for carrying cash and reducing transaction times. E-tickets and QR codes streamline entry processes, minimizing wait times and removing the hassle of managing physical tickets.

Integrated services in all-in-one travel apps consolidate multiple functionalities, including booking, navigation, and information access, into single platform, simplifying the visitors journey. Real-time translation apps help overcome language barriers, making interactions with local vendors and guides smoother and more convenient.

Fast-track systems and biometric scanners expedite access to attractions, further reducing waiting times and enhancing visitor satisfaction. Pre-booking options for popular attractions ensure timely access and efficient crowd management, contributing to a seamless and speedy experience.

Smart technologies play a crucial role in enhancing visitor engagement and enjoyment, topics in which we go into more detail later on the questionnaire analysis. Augmented Reality (AR) and Virtual Reality (VR) applications offer immersive experiences, such as virtual tours and interactive exhibits, which captivate visitors and make the attractions more engaging. Gamified elements within apps, like scavenger hunts and interactive challenges, add an element of fun and interaction, making the exploration of attractions and destinations more enjoyable.

Social media integration allows tourists to document and share their experiences in real time, connecting with friends and family, amplifying their enjoyment. Live streaming features enable visitors to broadcast their adventures, adding to the excitement and creating a dynamic and memorable experience.

The combination of these smart technologies ensures that visits to touristic attractions are not only more efficient but also more memorable. Enhanced storytelling through multimedia guides, including audio and video content, provides rich historical context engaging narratives, making the visit educational and unforgettable. Interactive displays at attractions further engage visitors through sensory-rich experiences.

Personalized souvenirs, such as customizable keepsakes created through 3D printing and on-site photo booths, allow tourists to take home unique memories of their visit. Digital scrap books and photo apps help visitors compile and preserve their memories, ensuring they can revisit and cherish their experiences long after their trip has ended.

In conclusion, STTs positively influence the active phase of the customer journey by enhancing flexibility, providing convenience and speed, and facilitating engagement and enjoyment. These technologies create a more attractive and memorable visit experience at tourist attractions confirming hypothesis 4. By leveraging these advancements, touristic destinations can meet the evolving expectations of modern travelers and provide exceptional, lasting impressions.

4.3 Reflective phase

Over the next seven items of the questionnaire, the main aspects analyzed coincide with the reflective phase of the customer journey map, where travelers review their trips and experiences, through seeing the photos or sharing recommendations and writing reviews.

Over the last decades, the way memories are collected has completely changed, in specific photos have gone from analog to digital, nowadays everything is stored on the cloud, which means storing more photos and videos without occupying a physical space itself. In the first item of this section travelers were asked to rate the convenience of STTs when recollecting memories, overall, all of the respondents highly agreed with the statement, 77 respondents highly agreed, 55 slightly agreed, 36 were neutral, 20 slightly disagreed and 12 highly disagreed (Figure 23).

Younger respondents (18-34) show a strong positive association with using smart tourism technologies for organizing memories. This could be due to the widespread use of smartphones, social media, and apps dedicated to photo and video organization. As expected, older respondents (45 and over) show a more moderate or negative view, with many indicating

that they either do not use these technologies or don't find them essential for organizing travel memories.

For tourism companies, this suggests that promoting or integrating smart technologies that assist with memory recollection (e.g., photo apps, travel journals) might be more effective in appealing to younger generations, while older travelers may need further encouragement or alternative options.

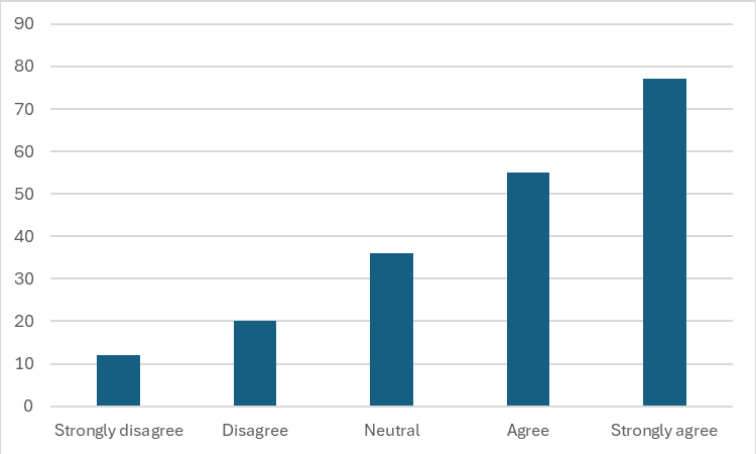

Figure 23: STTs help me recollect memories.

As it has been pointed out before during the paper, the internet and social media have taken over our lives, we communicate through them, mainly generations Z and millennials, as we´ve grown alongside the appearance of social media. On item twenty fourth, the tourists were asked how often they share their experiences through social media. As I had expected, the responses differed from each other, over 61 respondents answered that they highly agreed, 48 slightly agreed, 35 were neutral responses, 21 slightly disagreed and 35 totally disagreed (Figure 24).

The use of social media to share travel experiences is strongly prevalent among younger respondents (18-34 years). In contrast, older age groups (45 years and up) show much lower engagement with social media, with many respondents either neutral or actively rejecting the idea of posting travel content online.

This trend highlights the importance of social media in targeting younger generations with smart tourism technologies. Social media can be a valuable platform for marketing and engagement, especially through user-generated content like photos and videos. For older travelers, however, strategies may need to be adapted, focusing on different communication methods or less social media-oriented platforms.

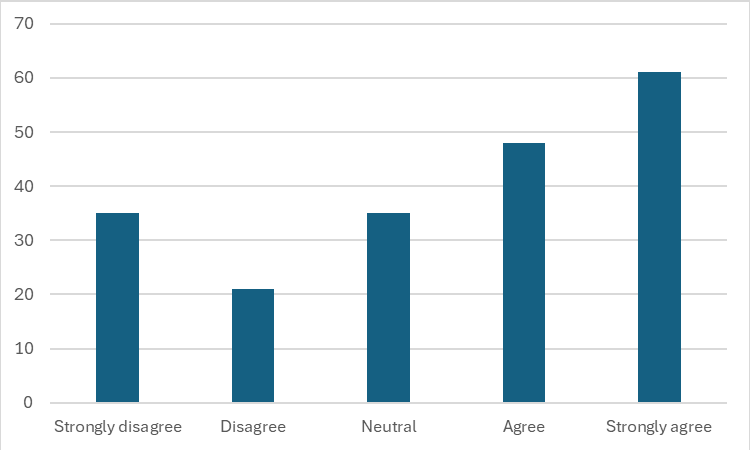

Figure 24: I share experiences through social media.

Another form of making suggestions and recommendations, and the most used by everyone is word of mouth, meaning that people make suggestions and recommendations just by talking with people and letting them know their experience and perspective. To this item 100 travelers answered that they totally agreed, 57 that they slightly agreed, 32 neutrally, 6 that they slightly disagreed and 5 that they totally disagreed (Figure 25).

Younger generations (18-34 years) are the most active in making recommendations to friends and family. This aligns with the high use of social media and digital communication tools, where word of mouth happens not only in person but also through online platforms.

Older age groups (45+ years) show a gradual decline in word-of-mouth activity, particularly as digital channels become less central to communication for these groups. However, even for older generations, word of mouth still plays a role, especially in smaller or more personal circles.

These findings indicate that younger travelers can be powerful brand advocates for tourism services, as they are more likely to recommend destinations, services, and experiences to their peers. Targeting older groups may require a more tailored approach, focusing on offline recommendations and engaging them through more traditional means.

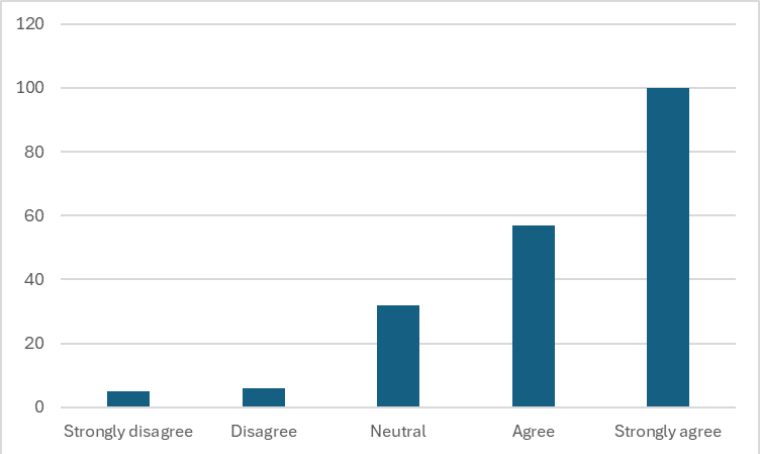

Figure 25: I make recommendations through word of mouth.

On item twenty-six they were asked if they usually write reviews online, to which most answers were totally in disagreement, 20 totally agreed, 47 slightly agreed, 36 answered neutrally, 39 slightly disagreed and 58 that they totally disagreed (Figure 26).

Younger generations (18-34) show incredibly low engagement in writing reviews. This suggests that, while they are active online and share experiences in other ways (such as through social media), they are less inclined to leave formal, text-based feedback on platforms like Google or review websites.

Middle-aged groups (35-54) show moderate engagement with writing reviews, with about 30% agreeing to leave feedback. These individuals may have more experiences with travel, a deeper understanding of the value of reviews, or simply be more comfortable with the review process.

Older generations (55+) have extremely low engagement in writing reviews, possibly due to less familiarity with digital platforms or a preference for offline communication. This group also may feel that their experiences and feedback are best shared through personal networks rather than online platforms.

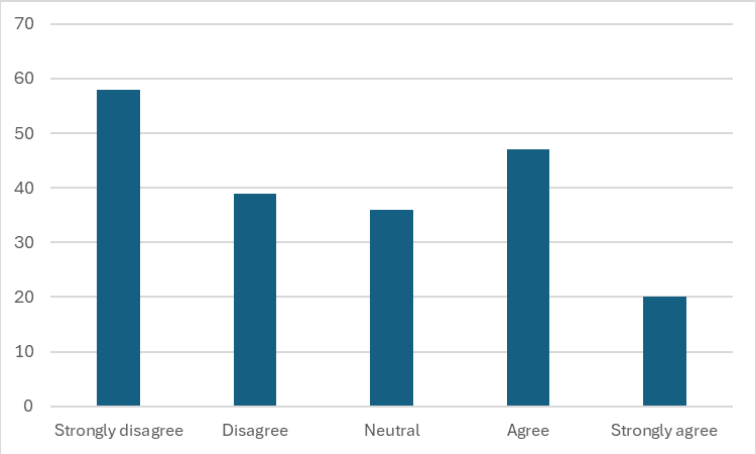

Figure 26: I write reviews online.

Moving on from the reviews and recommendations, the goal of item twenty-seven is to make the respondents think on which whether STTs contribute to sustainability, as there is a dispute between those who say that technologies do not contribute, which we can see on the answers to the question, 30 out of the 200 respondents said that they totally contributed, 30 that they agreed, the majority, 61 respondents, were neutral, 37 slightly disagreed and 19 totally disagreed (Figure 27).

Younger respondents (18-34) generally acknowledge the role of smart technologies in promoting sustainability but remain moderately optimistic. They are more open to innovations in the tourism industry and value environmentally conscious solutions, though they may still have questions about the overall impact.

Middle-aged respondents (35-54) express a balanced view, recognizing potential but not fully convinced of the widespread benefits. They may have concerns about the actual effectiveness or impact of smart technologies in real-world applications.

Older generations (55 and above) demonstrate more skepticism, with a considerable number disagreeing that smart technologies contribute to sustainable practices. This may stem from less exposure to eco-friendly technologies or a stronger preference for more traditional, established methods of sustainable tourism.

Overall, the results suggest that while smart technologies are recognized as having potential in the tourism industry's sustainability efforts, the belief in their effectiveness varies, with younger generations being the most open to these innovations.

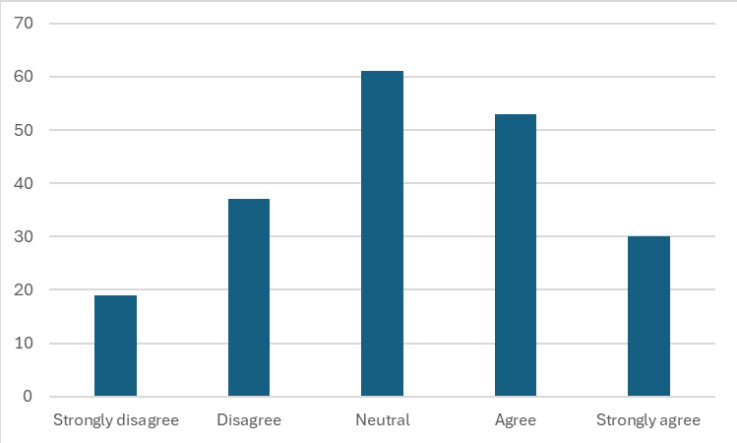

Figure 27: STTs contribute to sustainable practices.

We can see relatively similar answers on item twenty eight, where tourists were asked if they thought that STTs impacted culture, 38 totally agreed, 62 slightly agreed, 66 responded neutrally, 18 slightly disagreed and 16 totally disagreed (Figure 28).

Younger respondents (18-34) show the strongest belief that smart tourism technologies enhance their cultural and social interactions. This suggests that younger tourists may be more inclined to engage with technology in order to experience and share culture and social activities during travel.

Middle-aged groups (35-54) express a more neutral stance. While there is still moderate agreement, the higher level of neutral responses suggests that this group might be more selective in how they perceive the impact of technology on their travel experiences. They may value some technological tools but do not consider them essential for cultural engagement.

Older respondents (55 and above) show a significant lack of belief in the role of smart technologies for enhancing cultural and social experiences. Older tourists may avoid or be unfamiliar with technologies like mobile apps or social media platforms that facilitate cultural immersion or socializing, thus resulting in a more pessimistic or neutral view of their usefulness.

Overall, the responses indicate that younger tourists are the most enthusiastic about the impact of smart tourism technologies on their cultural and social experiences, whereas older tourists are more skeptical or indifferent.

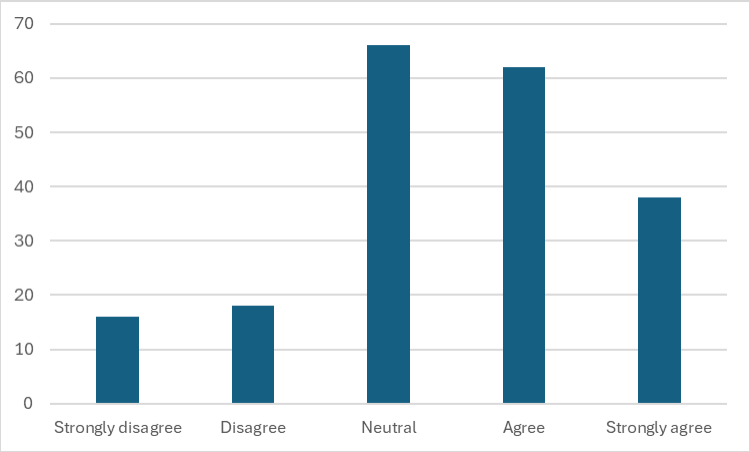

Figure 28: STTs impact my cultural and social experiences.

On the last item of this section respondents were to rate their concern with the main worry of using technologies, privacy, 31 of the respondents said that the privacy concerns associated with the technologies impacted when using them, 71 slightly agreed, 58 were neutral responses, 30 slightly disagreed and 10 totally disagreed (Figure 29).

Younger respondents (18-34) are more likely to express concerns about privacy affecting their trust, but these concerns do not seem to overwhelm their willingness to use smart tourism technologies. Despite concerns, many still trust and use the technologies, possibly because they are more accustomed to digital tools and feel comfortable managing privacy risks.

Older respondents (35+) show a lower concern about privacy impacting their trust. However, there are still mild concerns among some groups, particularly in the 45-54 age range, where a higher neutral response rate indicates uncertainty or moderate awareness of privacy issues but no strong deterrence from using the technologies.

The over-65 group shows the least concern about privacy impacting trust, with very few respondents expressing concerns. This could reflect lower usage of smart technologies or a lack of awareness regarding privacy risks.

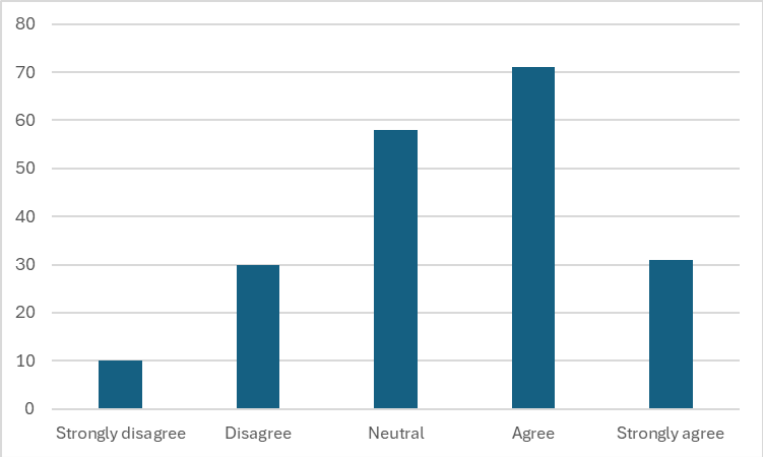

Figure 29: Privacy concerns impact my trusts on STTs.

After looking at the answers we can confirm hypothesis 5 “Smart tourism technologies positively impact the reflective phase by offering platforms for tourism to share their experiences and insights, as well as to evaluate their trips, contributing to an attractive and memorable experience.

The influence of smart technologies on the reflective phase of the customer journey is profoundly positive, as evidenced by their ability to provide platforms for sharing knowledge, information, and evaluations of experiences. These technologies facilitate a richer and more engaging post-visit phase.

STTs have revolutionized the way tourists share their travel experiences. Social media platforms like Instagram, Facebook and TikTok enable tourists to post photos, videos, and stories, allowing them to relive their adventures and share them with a global audience. The ability to live-stream further enhances real-time sharing, creating an immersive and immediate connection with viewers.

Moreover, the rise of travel blogs and video vlogs has provided tourists with powerful tools to document and share detailed accounts of their journeys. This user-generated content is influential, offering personal insights and practical advice that can inspire and guide future travelers.

Smart tourism technologies also provide robust mechanisms for evaluating travel experiences. Review sites and apps like TripAdvisor or Google reviews allow tourists to leave detailed feedback and ratings for attractions, accommodations, and dining experiences. This feedback is invaluable for other travelers seeking authentic insights and helps service providers improve their offerings.

Additionally, platforms often employ analytics to aggregate and analyze this feedback, providing deeper insights into customer satisfaction and preferences. These analytics can drive personalized recommendations for future trips, enhancing the overall travel experience.

STTs also enhance memory and attractiveness, the ability to preserve and revisit travel memories is another significant benefit of smart technologies. Digital photo albums and travel diary apps enable tourists to compile and organize their travel memories in an easily accessible format. Cloud storage services like Google Drive or iCloud ensure these memories are securely stored and available for future reflection.

Interactive maps and itineraries on travel apps offer tourists a way to visually retrace their steps and reflect on their experiences. Virtual reality (VR) experiences allow for a unique re-experiencing of trips, adding a new dimension to memory preservation.

Furthermore, online travel communities and forums provide a space for tourists to connect, share stories, and exchange advice, fostering a sense of belonging and continued engagement with their travel experiences. This community aspect enhances the attractiveness and memorability of their trips, as tourists feel part of a larger network of explorers.

In conclusion, smart tourism technologies significantly enhance the reflective phase of the tourist journey. By providing platforms for sharing knowledge and information and evaluating experiences, these technologies help tourists create, preserve, and reflect on their travel memories. This not only renders their travel experiences more attractive and memorable but also inspires and informs future travelers, confirming the hypothesis that smart technologies positively influence the reflective phase of tourism.

4.4 Satisfaction and revisit intention

The aim of the last part of the questionnaire is to analyze the satisfaction and the revisit intention produced by smart tourism technologies. This part of the questionnaire is formed by 10 questions and by analyzing them we will confirm hypothesis 6, 7 and 8.

On item thirtieth, respondents need to rate if “The quality of smart tourism technologies can enhance their satisfaction with the destination” as quality is the main aspect people look out for in activities and experiences, and if travelers have enjoyed it, the sense of quality is going to be higher. Out of the 200 respondents, less than a quarter (45) totally agreed, the main response was slightly agreed with 75 respondents, 48 answered neutrally, 22 slightly disagreed, and 10 totally disagreed (Figure 30).

Younger tourists (18-34) seem to strongly appreciate the role that smart tourism technologies play in enhancing satisfaction with destinations. These groups are more accustomed to using technology and are likely to find that it adds convenience or enriches their travel experience.

Older age groups (35+) show a moderate to lower level of agreement, indicating that while smart technologies are acknowledged for their potential to enhance satisfaction, they might not be as central to the experience for these respondents. The older tourists may value traditional travel experiences more and be less engaged with tech-driven enhancements.

The neutral response rate increases with age, especially in the 55+ group, reflecting a lack of strong opinion or lower engagement with smart tourism technologies. This suggests that for these groups, the quality of these technologies might not be a priority when selecting or evaluating destinations.

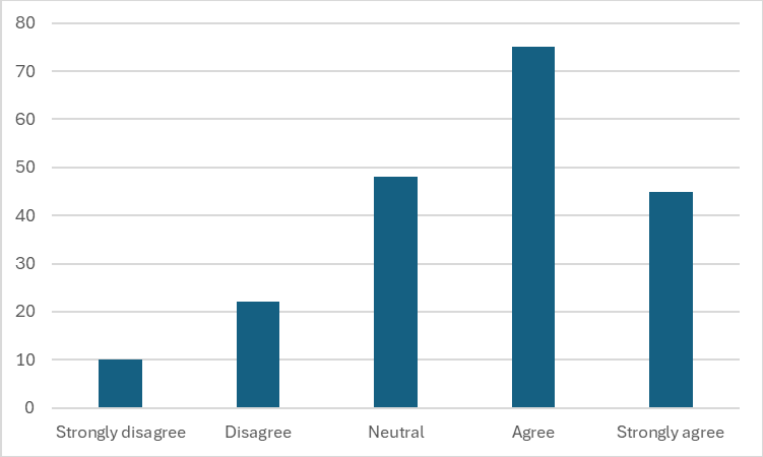

Figure 30: The quality of STTs enhances my satisfaction.

One of the key aspects of STTs is that they give you the ability to personalize experiences, which can lead to a higher engagement with local business and attractions. On item thirty one they were asked their agreement with it, the lowest response was totally agree with just 16 respondents, on the other hand, most of the respondents (81) answered that they slightly agree, meaning that even if they do not totally agree they see some truth on the fact that if they are given the possibility to personalize their experiences, the travelers interact more. 38 were neutral responses, 35 slightly disagreed and 30 totally disagreed (Figure 31).

Younger tourists (18-34) show a stronger connection with personalized mobile apps, agreeing that these apps enhance their engagement with local businesses and attractions. This indicates that younger generations are more comfortable with and likely to benefit from technology-driven suggestions during their travels.

Older travelers (35+) show a diminished reliance on these apps. Many respondents are neutral or disagree, suggesting that older tourists may be less interested in personalized apps or feel that these apps do not significantly improve their travel experience.

The neutral response rate is high among older age groups, indicating that they may be unaware of or uninterested in personalized travel apps, or they might prefer traditional methods of planning and exploring. In contrast, younger groups tend to have more positive experiences using these apps.

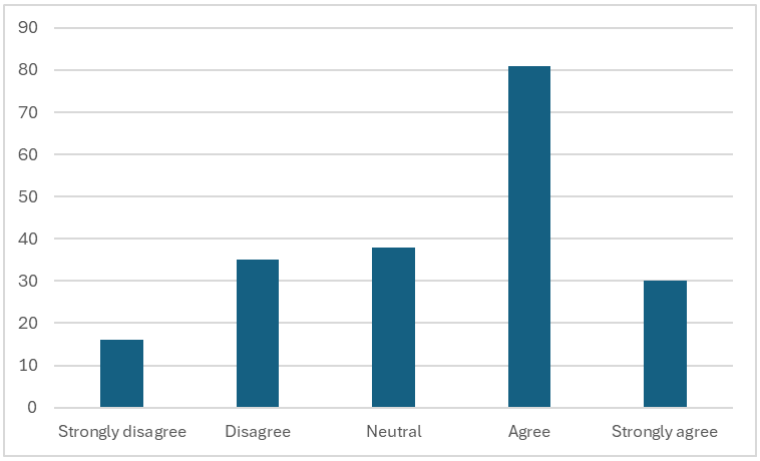

Figure 31: Personalized recommendations affect my engagement.

As I mentioned before, wearable technologies have become more popular with the years, and they can help make experiences better and more enjoyable. On item thirty-four respondents needed to rate their perception of whether this kind of STTs can improve experiences. Just 29 respondents answered totally in agreement, 68 slightly agreed, 60 were neutral, 27 slightly disagreed and 16 totally disagreed (Figure 32).

Younger age groups (18-34) show a clear preference for wearable technologies and smart devices during their travels, agreeing that these devices enhance their efficiency and enjoyment. This indicates that younger travelers are more tech-savvy and open to using advanced technology to improve their travel experiences.

Older age groups (45+) have a more reserved view of wearable technologies. The neutral responses are high, showing that they may not actively seek out wearable devices or may not view them as essential to their travel enjoyment. Disagreement rates also rise as the age increases, suggesting that older generations are less likely to adopt wearable technologies for travel-related benefits.

The declining interest in wearable technologies as age increases is clear. Technology adoption is generally higher in younger groups, whereas older travelers may not see wearable

technologies as integral to their travel needs, due to comfort with traditional methods of managing travel.

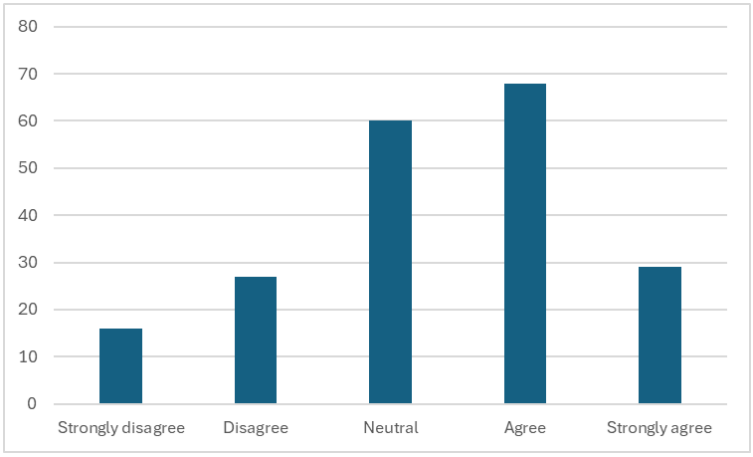

Figure 32: Wearable technologies impact my travel experience.

Other ways smart tourism technologies have added value to the industry are by incorporating chatbots and virtual assistants to make the customer more satisfied. On item thirty-three, respondents had to rate whether they agreed with it or not, the responses were very equal, almost the same number voted that they slightly agreed (40), neutral (45), slightly disagree (42), and totally disagreed (46), on the other hand just 27 answered that they totally agreed (Figure 33).

Younger age groups (18-34) show more openness to using chatbots and virtual assistants, but the percentage of total agreement remains low. Many respondents expressed neutrality or disagreement, which suggests that while they may use these technologies, they may not fully trust or rely on them to meet their customer support needs.

Older age groups (45+) display a much stronger preference for human interaction in customer support. The neutral and disagreement rates are higher, particularly among those aged 55-64 and 65+, suggesting that automation (in the form of chatbots or virtual assistants) is not highly trusted or appreciated by these generations for customer service.

Despite the increase in automation across many industries, older generations (45+) exhibit significant skepticism toward using automated systems for customer service. They tend to prefer direct, human communication, due to generational differences in comfort with technology.

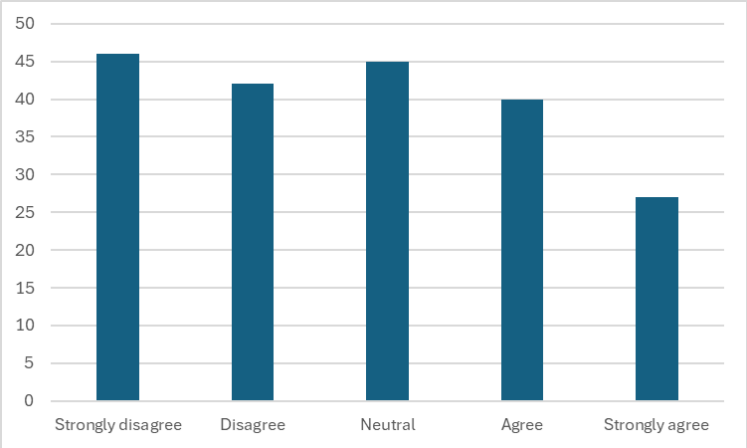

Figure 33: Virtual assistants improve my satisfaction.

Another aspect smart tourism technologies have brought has been the gamification of travel experiences, travelers can now experience a trip without the need of leaving their house or country by using virtual reality glasses and ai tools that simulate the destination. This is a relatively new sector which not many people have experienced, and that shows on the responses to item thirty-four that talks about if these kinds of experiences enhance satisfaction, just 21 of the respondents totally agreed, 40 slightly agreed, 60 voted neutrally, 39 slightly disagreed and another 40 totally disagreed (Figure 34).

Younger age groups (18-34) show the most interest in gamification and augmented reality, but the total agreement rate is still relatively low. Many travelers in these age groups are either neutral or disagreeing, suggesting that gamification and AR may not be the primary motivators for their satisfaction during travel.

Older age groups (45+) show minimal interest in these technologies, with many respondents expressing neutrality or disagreement. The lack of engagement with augmented reality and gamification could be due to less comfort with technology or simply a preference for traditional travel experiences that do not rely on interactive or digital enhancements.

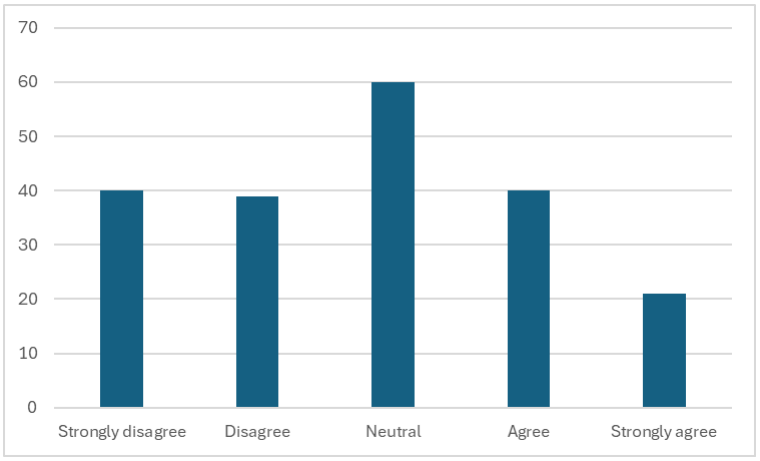

Figure 34: The gamification of travel experiences enhances my engagement.

On item thirty five, respondents were asked if they would recommend destinations that use smart tourism technologies, to which 42 respondents said that they would totally recommend, 47 that they would slightly recommend, other 47 responded in neutrality, meaning that they would recommend these destinations if they were asked, 35 respondents said that they were not likely recommend them and 29 that they totally would not recommend them (Figure 35).

Younger age groups (18-34) show a moderate level of interest in recommending destinations with smart tourism technologies. However, there is a significant portion that is neutral or disagreeing, indicating that these technologies are not a strong factor in their decision-making when recommending destinations.

Older age groups (45 and up) show a marked disinterest in recommending destinations based on the use of smart tourism technologies, with significant neutral or disagreement responses. Recommendations in these groups seem to be less influenced by the integration of such technologies.

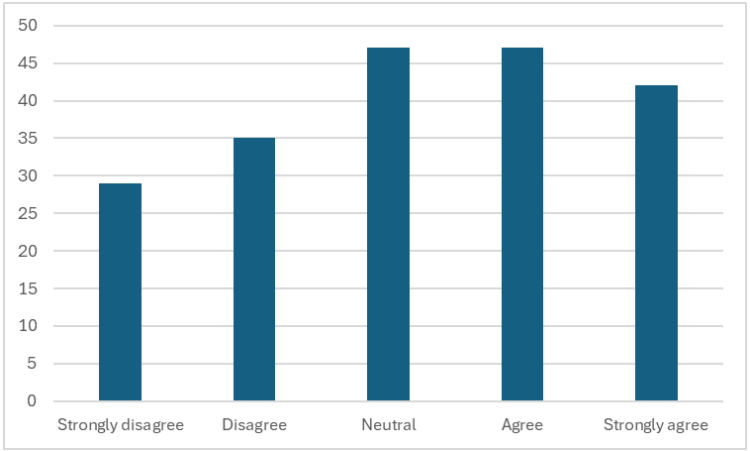

Figure 35: I recommend destinations that use STTs.

Although there were some negative responses, on item thirty-six, they were asked to rate the statement “Destinations that offer smart tourism technologies beyond my expectations make my travel more pleasant” to which the majority answered in agreement. 41 respondents totally agreed, 62 slightly agreed, over a quarter (56) of the responses were neutral, 21 slightly disagreed and 20 totally disagreed (Figure 36).

Younger age groups (18-34) show a moderate to positive response to the idea that smart tourism technologies exceeding their expectations improve travel pleasure. However, the neutral responses and disagreement indicate that these technologies are not universally appealing.

Older age groups (45+) are less enthusiastic about the impact of exceeding expectations with smart tourism technologies. Their neutral and disagreement rates suggest that this group places less importance on technological innovation in travel satisfaction.

35-44-year-olds show a more positive reception, with a clear majority finding satisfaction in destinations that offer smart technologies exceeding their expectations.

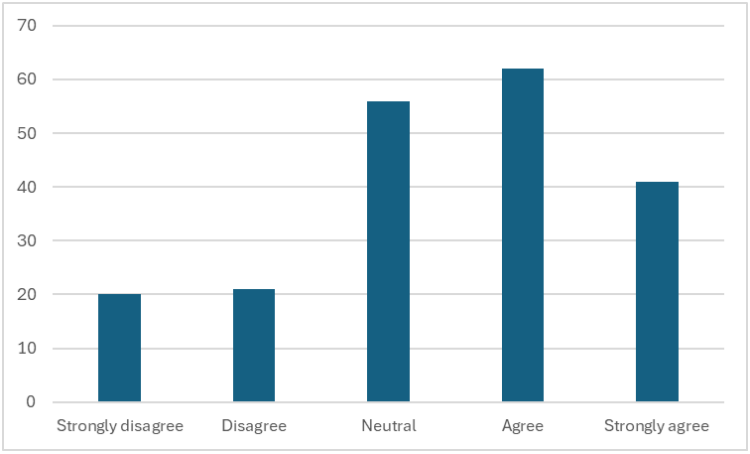

Figure 36: Destinations that offer STTs make my travel more pleasant.

Back to the topic of personalization, on item thirty-seven, respondents are asked if STTs help them personalize their travel experiences, to which mainly, everyone answered in agreement, 47 totally agreed, 71 slightly agreed, 52 were neutral responses, 14 slightly disagreed, and 16 totally disagreed (Figure 37).

Younger age groups (18-34) show the strongest agreement that smart tourism technologies help personalize travel experiences. However, there is still some neutrality and disagreement in these groups.

Older age groups (45 and above) show a weaker appreciation for the personalization aspect of smart tourism technologies, with the 45-54-year-old group showing a more moderate response. The 55-64 and over-65 groups indicate less impact or awareness, with a higher percentage of neutral and disagreement responses.

The data shows that while personalization via smart technologies is viewed as beneficial by younger travelers, older travelers tend to have a lesser interest or experience with it. This could reflect a lower adoption rate of technology or different priorities when traveling among older generations.

In relation to it, on item thirty-eight, they had to rate whether the fact that they could personalize their experiences made them better and more satisfied with them. Again, most of the responses agreed, over a quarter (59) totally agreed, over another quarter (68) slightly agreed, 42 had neutral responses and an eighth were in disagreement, 13 slightly disagreed and 12 totally disagreed (Figure 38).

Younger travelers (18-34) show the strongest agreement that personalized travel experiences lead to greater satisfaction. There is minimal disagreement in this group.

Older travelers (45 and above) are less convinced that personalization is a key factor in their travel satisfaction. 45-54-year-olds show some positive sentiment, but the responses become more neutral or negative with age. 55-64 and 65+ age groups show the lowest engagement with personalized travel experiences, indicating they may not prioritize personalization as much as younger generations.

Overall, the data shows a clear generational gap in how much personalization influences satisfaction. While younger travelers (especially in the 18-34 range) highly value personalized travel experiences, older generations seem to focus on other aspects of travel, with lower reliance on technology for personalizing their experiences.

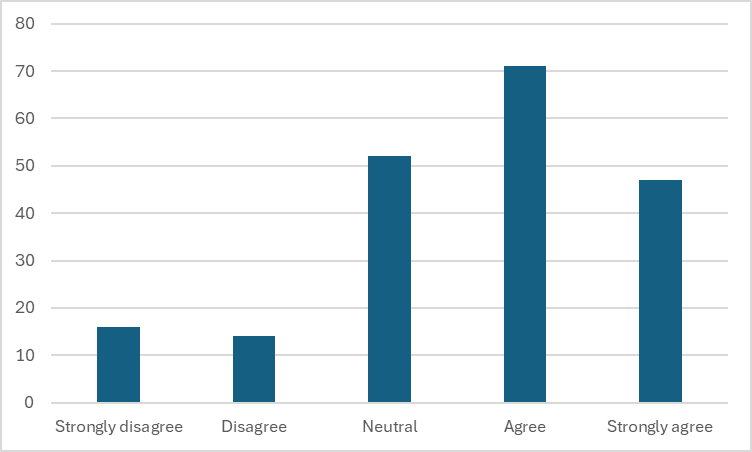

Figure 37: STTs have helped me personalized my trip.

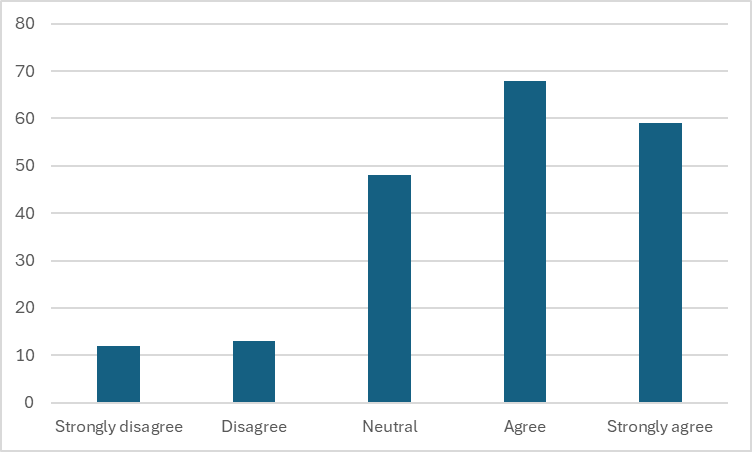

Figure 38: Personalizing my trip creates a better experience.

On the last item the respondents had to answer how likely they were to travel to a destination with STTs, to which the responses were very equal, 29 totally agreed, 53 slightly agreed, 43 were neutral, 36 slightly disagreed and 39 totally disagreed (Figure 39).

Overall, younger generations (18-34 years old) are more receptive to the idea of traveling to destinations that offer unique smart tourism experiences. However, the appeal of smart tourism technologies seems less significant for older generations, with the 55+ age groups showing a noticeable lack of interest in such travel offerings. This indicates that while smart tourism may be a key motivator for the younger traveler segment, it is less influential for older travelers, who may prefer more traditional aspects of travel.

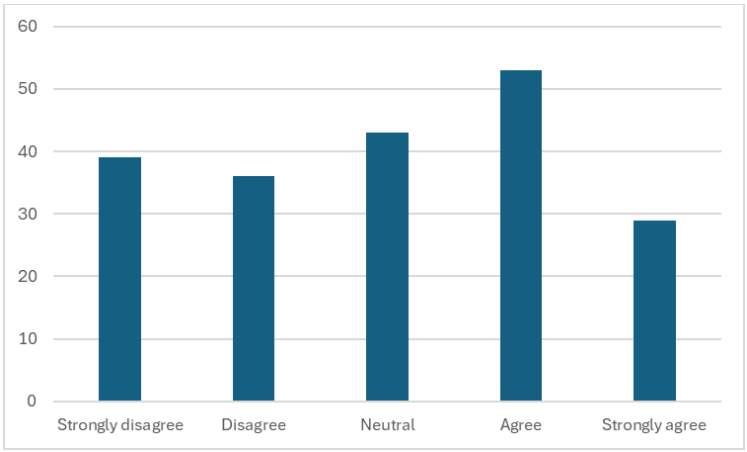

Figure 39: I will travel to destinations with STTs.

After looking at the answers, we can certainly confirm hypothesis 6 “Smart tourism technologies can help you personalize and customize your trip which leads to a greater satisfaction of the tourist”, hypothesis 7 “The adoption of smart tourism technologies

significantly influences travelers by enhancing convenience personalization and overall, the travel experience", and finally hypothesis 8 "There is a significant relationship between how smart tourism technologies are perceived and memorable tourism experiences".

The impact of smart tourism technologies on the travel experience is profound, spanning personalization, convenience, and the creation of memorable experiences. Each of these hypotheses can be confirmed by examining the responses of the questionnaire.

STTs play a key role in enhancing the travel experience by enabling a high degree of personalization and customization, which directly leads to greater satisfaction among tourists. These technologies leverage data analytics, artificial intelligence, and user-friendly interfaces to tailor travel experiences to individual preferences and needs, ensuring that each journey is uniquely fulfilling.

The adoption of STTs significantly influences travelers by enhancing convenience. Mobile apps and digital platforms streamline the booking process for flights, hotels, and activities, allowing travelers to plan and manage their trips effortlessly from a single interface.

Lastly there is a significant relationship between how smart tourism technologies are perceived and the creation of memorable tourism experiences. Tourists who perceive these technologies as user-friendly, reliable, and valuable are more likely to have positive and memorable experiences. As mentioned before the perception of smart tourism technologies is shaped by factors such ease of use, functionality, and the value they provide to the travel experience.

So, the ability of smart tourism technologies to personalize and customize travel experiences significantly enhances tourist satisfaction. By providing tailored recommendations, customized itineraries, and adaptive experiences, these technologies ensure that each trip is uniquely suited to the traveler's preferences and needs. The resulting convenience, alignment with individual desires, and creation of memorable experiences confirm hypothesis 6, 7 and 8. This personalization is crucial in today's travel industry, where meeting and exceeding travelers' expectations is a key to success.

4.5 Questionnaire responses as generational differences

After analyzing the questionnaire, we can confirm hypothesis 1 "Smart tourism technologies have more impact on the younger generations than older ones", and hypothesis 2 "Younger generations tend to use social media as a travel inspiration tool".

Although we can confirm hypothesis 1, we can see in the responses to question 19 (Figure 19) how technologies such as artificial intelligence (AI), virtual reality (VR), augmented reality (AR),

and virtual assistants are a topic on which over a quarter completely disagreed (52), and nearly another quarter slightly disagreed (46), as well as neutral responses (46), and just 35 said that they agreed and 19 that they highly agreed (Figure 19). As expected, the ones that totally disagreed were the older generations, on the contrary we can see that generations Z and millennials slightly agreed with the statement.

- Generation Z: Despite being technological natives, Generation Z exhibits a cautious approach toward certain emerging technologies like AI, VR, and AR, which are still relatively unknown to them. They are not extremely comfortable using these technologies for planning the trip as they often find them very intimidating and unnecessary, they prefer more familiar tools and applications. While they tend to avoid writing reviews online, they prefer word-of-mouth communication within their social circles. Additionally, chatbots and virtual assistants are not highly considered by this generation, they prefer interactions with real assistants who can provide personalized information. Nonetheless, they heavily use social media for travel inspiration, content sharing, and real-time updates, displaying how comfortable they are with the internet and technologies. Generation Z values technologies as a great tool for connectivity and for enhancing their travel experiences through shared recommendations and experiences.

- Millennials: Like Generation Z, Millennials are not very familiar with VR and AR and prefer word-of-mouth over writing online reviews. They grew up during the rapid evolution of technology, which makes them comfortable with certain technological tools such as mobile apps and online booking platforms. However, privacy concerns influence their use of technology when planning a trip. They tend to be wary of data security and prefer transparent platforms that guarantee privacy. While they trust and are comfortable with some technologies developed during their adolescence, they are still skeptical about virtual assistants and chatbots, often them finding them impersonal and less reliable, as Generation Z. Millennials do not extensively share travel recommendations on social media, although they do utilize technology for certain aspects of their travel planning, such as using travel blogs and content to discover new destinations.

- Generation X: This generation is unfamiliar with AI and does not use social media for travel inspiration. Generation X prefer to obtain their travel information from official sites or blogs rather than using VR or AR. They value credibility and detailed information, often turning to expert reviews and well stablished travel resources like guides. They do not share content or write reviews online, preferring face-to-face or direct

communication methods. Like Generation Z and Millennials, this generation is skeptical of chatbots and virtual assistants, which they find highly impersonal and often unhelpful, and prefer real human interactions that provide a personal touch to their specific assistance.

- Baby Boomers: These are the least technological generation, as the internet was invented when they were already grownups. Technologies such as AI, VR, and AR are largely unknown to them, and they are not used at all. They avoid social media and are not influenced by it, preferring traditional sources like books and travel guides like Generation X. They are least likely to experiment with new technologies, due to the lack of familiarity and comfort with digital tools. Baby boomers do not engage in sharing online reviews and find modern technological tools daunting. They place a high value on human interaction and personal service, often preferring to speak directly with travel agents or customer service representatives who can provide a personalized experience.

From these observations, it is clear that younger generations, particularly Generation Z and Millennials, are more impacted by smart tourism technologies, although with some exceptions. Technologies are involved in every aspect of their lives, and they are highly influenced by it, compared to Generation X and Baby boomers who prefer traditional methods and have a more limited engagement with the recent technologies. This difference is due to the various levels of digital literacy and comfort with technology.

For understanding and confirming hypothesis 2, we must have in mind that it is due to generational differences, in this case, the sole of social media as a travel inspiration tool is incredibly significant among younger generations.

- Generation Z: this generation uses social media extensively as a travel inspiration tool. They actively share content, recommendations, and real-time updates on platforms like Instagram, TikTok, and Snapchat. For this generation social media is a primary source for getting travel ideas, and it influences their travel choices significantly. They rely on user-generated content, influencer posts, and peer recommendations to discover and plan their trips. This generation prefers this form of research over traditional advertisements and promotions.
- Millennials: While millennials do not share travel content as prolifically as Generation Z, they still use social media for travel inspiration. Platforms like Facebook, Instagram

and Pinterest serve as valuable sources of information. They consume content and get influenced by the travel posts by others, even if they are less active in content creation. Millennials often follow travel bloggers, influencers, and brands to stay updated on travel trends and destinations, using this information to create their prefect trip.

- Generation X: Social media does not play a significant role for this generation when it comes to planning a trip. They neither rely on these platforms nor use them for travel purposes, preferring to gather information from official sites, blogs, and other non-social media sources. Therefore, social media has minimal influence on their travel decisions. Generation X tends to trust traditional media and well-stablished travel authorities more than user-generated content on social media.
- Baby boomers: This generation is the least influenced by social media when it comes to travel inspiration. They do not use these platforms and instead turn to traditional media like books and travel guides. Travel guides, and word-of-mouth and personal recommendations from friends and family. Baby boomers value trusted, authoritative sources and personal recommendations over digital and social media content, often viewing these sources as more reliable and comprehensive.

So, by saying looking at the answers to question 6 (64 respondents totally agreed with the statement, 34 slightly agreed, these were the generation Z and millennials, from the 52 neutral responses most of them come from generation X, the ones in disagreement were generation X and boomers, 20 slightly disagree and 30 totally disagreed), question 7 (47 totally agreed, 54 slightly agreed, 44 were neutral answers, 35 slightly disagreed with the statement and 20 totally disagreed, the older respondents who belonged to generation X answered either neutral or in disagreement, the same happens with baby boomers, on the contrary from generation Z and millennials, who mainly agreed with it), question 8 (34 totally agreed, 75 slightly agreed, a quarter of the responses were neutral (42), and the other remaining quarter responded in disagreement, 38 slightly disagreed, and 11 totally disagreed, most of the respondents who answered in agreement represented the younger generations) and question 9 (16 totally agreed, 74 slightly agreed, 35 slightly disagreed, 21 totally disagreed and 54 respondents answered neutrally, being the ones more affected respondents who belonged to generation Z and Y), we can confirm hypothesis 2, younger generations, particularly Generation Z and millennials, use social media extensively as a travel inspiration tool. This trend is not something you can see in older generations.

5. Conclusion

In conclusion, this dissertation has explored the diverse impacts of smart tourism technologies on tourists, focusing on the crucial role of social media, on the different generational usage patterns and their various aspects on the customer journey map.

The findings of this dissertation highlight the different ways in which these technologies are reshaping the tourism industry, as well as influencing tourists' behaviors, their expectations and experiences.

As it has been stated in the dissertation, there are some essential generational differences in the adoption and utilization of STTs. The main outtakes are that generation Z and Millennials usually embrace the technologies, as they have grown with them, they are comfortable, and are drawn to personalized travel experiences that use some kind of technologies. These younger generations prioritize convenience, instant access to information, and seamless connectivity, often relying on mobile applications, augmented reality (AR), and artificial intelligence (AI) for recommendations to optimize their travel plans. To support this information, Wang et al. (2012) highlighted that these groups seek personalized and tech-enhanced travel experiences, relying on mobile applications, augmented reality (AR), and artificial intelligence (AI) to enhance their journeys.

In contrast, some studies like the one carried out by Kim et al. (2018), indicate that generation X and baby boomers exhibit a more selective adoption of patterns, they approach smart tourism technologies with more caution, prioritizing safety over technological advances, they often use technologies that enhance convenience and safety without overwhelming them. This generation appreciates the benefits of online booking systems, geo-localization apps and virtual tours, on the other hand, their engagement with social media and advanced smart tourism technologies is lower.

The survey findings consistently confirm hypothesis 1 "Smart tourism technologies have more impact on younger generations than older ones" as younger generations (18-34) show greater engagement with and appreciation for smart tourism technologies compared to older respondents. Younger travelers reported higher levels of agreement on the ability of these technologies to enhance travel experiences, including personalization, convenience, and overall satisfaction. In contrast, older generations (especially those aged 55 and above) expressed lower levels of agreement, with some demonstrating a lack of interest or outright disagreement. This supports the conclusion that smart tourism technologies resonate more with younger generations.

It is crucial for tourism companies and providers to understand these differences as it allows for the customization of services and marketing strategies to meet specific needs and expectations of each generation.

Since the emergence of social media, it has become an essential component of the tourism ecosystem, as it is a key platform for information dissemination, inspiration, and engagement, as Gretzel et al. (2010) posed, social media significantly influences travel-related information search and decision-making processes. The study highlights that social media platforms are not just tools for sharing experiences but have become fundamental to the entire travel cycle. From potential stages of inspiration where potential travelers seek out destinations and experiences through user-generated content and posts, to the planning and booking phases, social media provides a great bank of information and recommendations. During the travel itself, real time updates and location-based services enhance the tourist experience, offering immediate access to reviews, tips, and local insights. And finally post travel, social media facilitates the sharing of experiences and memories, closing the cycle as late on, those will influence other travelers, starting the cycle again.

This statement plus the responses to questions regarding social media as a source of travel inspiration highlight that younger generations are significantly influenced by platforms like Instagram, Facebook, and travel blogs. Confirming then hypothesis 2 "Younger generations tend to use social media as a travel inspiration too".Respondents aged 18-24 and 25-34 reported much higher agreement levels regarding the role of social media in travel planning compared to older groups, who expressed neutral or negative responses. These findings confirm that social media is a key tool for younger travelers when it comes to exploring destinations and planning their trips.

On their work, Munar et al. (2014) exposed that social media also serves as a powerful marketing tool for tourism businesses, as it allows them to engage with potential customers, building brand loyalty, and spread real-time updates. Further research by Zeng and Garritsen (2014) emphasizes the dual role of social media in both shaping tourists' behavior and serving as a strategic tool for destination marketing organizations. This demonstrates that social medias impact extends beyond the tourist as an individual, as it affects the marketing and engagement strategies employed by the suppliers, businesses can use the power of social medias to builds brand loyalty, engage with costumers, and tailor their offerings based on real-time feedback and trends. Therefore, the strategic use of social media can significantly enhance customer satisfaction and loyalty, driving business success in the competitive tourism industry.

In relation to it, the discoveries of this dissertation also show us that the integration of smart tourism technologies has significantly altered the traditional customer journey map, introducing new dimensions of interactivity and personalization at each stage, as we can see on the study carried out by Buhalis et al. (2015) where they discuss the concept of smart tourism, where the integration of ICTs enhances the tourists experience at every stage of the journey. Gretzel et al. (2015) added that from AI-driven search engines and virtual reality (VR) in the prospective phase to the IoT devices and mobile applications during the active phase, these technologies provide real-time information, convenience, and personalization.

As we´ve seen in the prospective phase, technologies such as AI, VR and interactive travel planning tools enable tourists to explore destinations and plan their itineraries in detail. This empowers travelers to make informed decisions based on personalized recommendations and real-time data, confirming hypothesis 3 "Smart tourism technologies enhance the prospective phase by offering tools and information, thereby positively influencing their travel decisions".

Survey participants across age groups largely agreed that smart tourism technologies (such as apps, websites, and AR/VR tools) improve the prospective phase by providing detailed, user-friendly information and tools to assist in decision-making. This was particularly evident in younger respondents, who indicated that these technologies help them explore and plan unique experiences, confirming this hypothesis.

On the active phase, technologies such as mobile applications, Geo-localization, and IoTs devices provide tourists with on-the-go access to information, navigation assistance, and real-time updates. Confirming hypothesis 4 “Smart tourism technologies improve flexibility, provide convenience, and speed, and facilitate engagement and enjoyment, resulting in a more attractive and memorable experience at tourist attractions”. Smart tourism technology tools enhance the travel experience by offering convenience, reducing uncertainties, and enabling tourists to make spontaneous decisions that enrich their journey.

The data strongly supports this hypothesis. Across multiple questions, respondents highlighted the value of convenience, speed, and engagement brought by smart tourism technologies. Features like mobile apps, augmented reality, and wearable devices were frequently linked to enhancing travel enjoyment and making experiences more engaging. Younger generations, in particular, viewed these aspects as key to creating memorable and attractive tourism experiences, affirming the hypothesis.

Lastly on the reflective phase, social media platforms and online reviews facilitate the sharing of experiences and feedback, creating a continuous loop of information that benefits future travelers. This phase also offers opportunities for businesses to engage with customers to gather insights and foster long-term relationships, which confirms hypothesis 5 “Smart tourism

technologies positively impact the reflective phase by offering platforms for tourism to share their experiences and insights, as well as to evaluate their trips, ultimately contributing to an attractive and memorable experience”.

Responses from younger respondents showed significant agreement with the role of smart technologies, such as social media, review platforms, and travel apps, in the reflective phase of travel. These technologies allow travelers to share experiences, evaluate trips, and provide feedback, which enhances their connection to destinations and creates positive memories. Although older generations expressed less enthusiasm for these features, the overall trend supports the hypothesis.

Satisfaction and its relation to perception, has also been a key outcome of the study, Gretzel et al., (2015) highlights that smart tourism technologies offer customized itineraries and location-based recommendations, which allow travelers to curate their own experiences based on preferences, therefore increasing satisfaction. This statement confirm hypothesis 6 “Smart tourism technologies can help personalize and customize your trip which leads to greater satisfaction of the tourist”.

The survey results consistently confirm this hypothesis, as many respondents highlighted the ability of smart technologies to personalize and customize travel experiences. Younger generations, in particular, associated personalization with increased satisfaction and memorable trips. The ability to tailor itineraries, access personalized recommendations, and adjust plans on the go was repeatedly cited as a major benefit of these technologies.

While the data suggests that smart technologies provide significant benefits such as convenience, personalization, and enjoyment, hypothesis 7 "The adoption of smart tourism technologies significantly influences travelers by enhancing convenience, personalization, and overall travel experience" requires further research. Although younger respondents strongly agreed with these benefits, older travelers showed more mixed responses, indicating that the influence of smart tourism technologies may vary depending on demographic and individual preferences. Thus, while the hypothesis seems valid, it cannot be confirmed with complete certainty at this stage.

The same happens with hypothesis 8 "There is a significant relationship between how smart tourism technologies are perceived and memorable tourism experiences". The survey results suggest a positive correlation between the perception of smart technologies and memorable tourism experiences, particularly among younger travelers. Respondents who viewed these technologies favorably often linked them to enhanced satisfaction and memorable trips. However, further research is needed to establish a definitive causal relationship, as older

generations demonstrated more neutral or negative responses, and additional factors beyond technology may contribute to memorable experiences.

Both Hypothesis 7 and Hypothesis 8 require further exploration. While there is strong evidence to support the claims, limitations in the survey data—such as varying levels of engagement across age groups and potential external factors—mean that these hypotheses, while plausible, cannot yet be confirmed with absolute certainty. More comprehensive studies focusing on diverse demographics and long-term trends are recommended to validate these hypotheses conclusively.

The synthesis of these key themes demonstrates the interconnectedness of social media, generation use if STTs, and customer journey map in shaping the modern tourist experience. Smart tourism technologies have revolutionized how tourists interact with destinations and have created a new type of tourist which is more informed, connected and looks out satisfying travel experiences.

The results of this study are essentially important for tourism businesses. By taking advantage of smart tourism technologies, businesses can enhance their services, tailoring their offerings to meet the diverse needs of each generation. Understanding them can also help them implement effective marketing strategies. Policymakers can also benefit from these insights by supporting the development and integration of smart tourism technologies in the tourism sector, fostering innovation, and ensuring that the benefits of these advancements are accessible to all segments of society.

In conclusion, smart tourism technologies are not just transforming the way tourists plan and experience their travels, they are redefining the very nature of tourism itself. The insights gained from this research provide a valuable foundation for future studies as these technologies continue to evolve, and promise to bring even greater levels of personalization, convenience and engagement, ultimately enriching the travel experience for tourists, it is essential to keep investigating on the matter.

Limitations and Perspectives for future work

While this dissertation provides valuable insight into how smart tourism technologies (STTs) impact the tourist experience across different generations, there are several limitations that should be acknowledged. These limitations may influence the generality and scope of the findings and suggest areas for improvement in future research.

For the study descriptive statistics were calculated to summarize the general trends in the data, while inferential statistics were applied to assess the hypotheses. The Likert scale data were analyzed using factor analysis and correlation tests to explore the relationships between STT usage and variables such as age, travel phase, and satisfaction. Regression analysis was also employed to determine the extent to which STT usage predicts tourist satisfaction and revisit intention. By using other forms of analysis, the result can be much more accurate, and less generic.

The study was conducted on a single hostel (The Newton Hostel in Madrid) over a three week period, which limits the diversity of the sample. Hostels tend to attract younger budget-conscious travelers, particularly those from Generations Y and Z. Consequently, the data may overrepresent these views and behaviors of younger generations, and under represent the ones from Generation X and Baby boomers, who are less likely to stay in hostels. The sampling limits the ability to fully generalize findings across all age groups and types of travelers.

Another limitation is that the study was geographically constrained to a single city (Madrid). While Madrid is a popular tourist destination, the results may not reflect the behavior of travelers in other regions or types of destinations.

The time of the study may also be a constraint. The data collection was very limited to a three week period in April 2024, which may have missed seasonal trends or variations in tourist behavior. Traveler´s preferences and behaviors might differ depending on the time of year, the availability of specific technologies, or temporary events in the region. Extending the data collection period or conducting a longer study could provide a more comprehensive and understanding of tourist behavior over time.

For future work this dissertation serves as a starting point for understanding the generational differences in how tourists use and perceive STTs. However, several routes for future research could further enrich the findings and address the limitations identified in this study.

Future studies should aim to broaden the sample population by including travelers from a wider variety of accommodations. This would capture a more diverse range of tourists, particularly those from older generations or with different travel preferences. Expanding the geographical

scope to include multiple destinations would also allow researchers to examine how STTs usage varies across different travel experiences.

Investigating how cultural factors influence the adoption and perception of STTs could offer insights into the global applicability of the findings. Future research could focus on comparing results from different cultural backgrounds or countries, this could provide a better understanding of the role of technology in the tourists' experience.

In the future the studies, could also focus on the impact of specific STTs rather than generalizing the broad range of technologies. For instance, researchers could investigate the distinct roles of mobile applications, augmented reality (AR), social media platforms, or smart hotel devices in shaping the tourist experience. Analyzing these individual technologies could help pinpoint which innovations are most influential.

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Appendix

Appendix 1

Variable	Question	Item	Reference
Demographic	**What is your sex?** – Male – Female **What is you age?** – 18-24 – 25-34 – 35-44 – 45-45 – 55-64 – 65+		
Customer journey map - Prospective Phase	**Question 1: I use smart tourism technologies to search and plan my trips (webs, social media, virtual reality, location-based systems…).** 1 – 2 – 3 – 4 – 5 **Question 2: I think smart tourism technologies help reducing decision rinks when planning a trip.** 1 – 2 – 3 – 4 – 5 **Question 3: The usage of smart tourism technologies increases my interest in certain destinations or activities.** 1 – 2 – 3 – 4 – 5 **Question 4: The usage of smart tourism technologies can help me build an understanding of the local culture**. 1 – 2 – 3 – 4 – 5 **Question 5: To what degree do you feel that artificial intelligence is tourism applications positively influences your decision-making**	Items 1 to 6 following the number of the question: Question 1= Item 1 Question 2= Item 3 Question 3= Item 2 Question 4= Item 4 Question 5= Item 5 Question 6= Item 6	Shen, S., Sotiriadis, M., & Zhang, K. (2020b). The Influence of Smart Technologies on Customer Journey in Tourist Attractions within the Smart Tourism Management Framework. *Sustainability*, *12*(10), 4157. https://doi.org/10.3390/su12104157 Of own invention: Question 5: It is important to know if people use artificial intelligence and if it affects positively as it has become a trend nowadays and is used in most of the aspects related to travel. Question 6: It is important to know how frequently people go to social media for inspiration.

	process when planning a trip? 1 – 2 – 3 – 4 – 5 **Question 6: On a scale of 1 to 5, how frequently do you use social media platforms (e.g., Facebook, Instagram, Twitter) to research travel destinations or seek recommendations?** 1 – 2 – 3 – 4 – 5		
Customer journey map – Active Phase	**Question 7:How much do you agree with the statement: "Social media platforms play a significant role in shaping my travel aspirations and desires"?** 1 – 2 – 3 – 4 – 5 **Question 8: On a scale of 1 to 5, how much do you think social media enhances your overall travel experience (e.g., by facilitating connections with locals, sharing experiences with others)?** 1 – 2 – 3 – 4 – 5 **Question 9: To what extend does real-time information sharing through social media and other platforms impact your behavior and decision making during your travels?** 1 – 2 – 3 – 4 – 5 **Question 10: Smart tourism technologies facilitate navigation and communication while on destination:** 1 – 2 – 3 – 4 – 5 **Question 11: Please rate your level of reliance on location-based services (e.g., Google Maps,**	Items 7 to 22 following the number of the question: Question 7= Item 7 Question 8= Item 8 Question 9= Item 9 Question 10= Item 10 Question 11= Item 11 Question 12= Item 12 Question 13= Item 13 Question 14= Item 14 Question 15= Item 15 Question 16= Item 16 Question 17= Item 17 Question 18= Item 18 Question 19= Item 19 Question 20= Item 20 Question 21= Item 21 Question 22= Item 22	Shen, S., Sotiriadis, M., & Zhang, K. (2020b). The Influence of Smart Technologies on Customer Journey in Tourist Attractions within the Smart Tourism Management Framework. *Sustainability*, *12*(10), 4157. https://doi.org/10.3390/su12104157 Of own invention: Question 7: Social media has become an essential part of our life in every context. Question 8: Through social media you can find unique places and recommendations on a destination. Question 9: People nowadays use social media (instagram/ tiktok) as a way of obtaining information on destinations and sharing it. Question 11: Location-based services have become essential in our day-to-day life.

	Yelp) during your travels. 1 – 2 – 3 – 4 – 5 **Question 12: Indicate the level of agreement with the statement "Location based services provided by smart tourism technologies significantly improve my ability to explore and discover new destinations".** 1 – 2 – 3 – 4 – 5 **Question 13: To what extent do you find smart hotel features (e.g., automated check-in/out, keyless entry) convenient during your stays?** 1 – 2 – 3 – 4 – 5 **Question 14: Smart tourism technologies enhance convenience and speed while on destination**: 1 – 2 – 3 – 4 – 5 **Question 15: Smart Tourism technologies help me make short term decisions while on destination:** 1 – 2 – 3 – 4 – 5 **Question 16: Smart tourism technologies enhance flexibility, engagement and enjoyment while on destination:** 1 – 2 – 3 – 4 – 5 **Question 17: Rate the convenience of using smart payment systems and digital wallets for financial transactions during your travels.** 1 – 2 – 3 – 4 – 5 **Question 18: Rate the effectiveness of real-time translation services in**		Question 12: people use location services like maps every time they travel. Question 13: Smart hotels are becoming more and more popular with the years. Question 17: smart payment like contactless or mobile payment are used everyday. Question 18: If you travel to a country with a different language, traductors are very useful. Question 19: Most travel/ destination websites use VR or AR to give a small example of what the tourist might experience. Question 20: Security has always been an important aspect of traveling, and smart destination management can help tourists learn which areas are safe and which ones are more dangerous. Question 21: Transport is essential for tourism, and using a smart transport system can help the tourist see the most effective and fastest way from one point to another. Question 22: Smart transportation options are a more sustainable way of traveling.

	smart devices in improving communication during your travels? 1 – 2 – 3 – 4 – 5 **Question 19: Indicate your level of agreement with the statement: "The use of augmented reality (AR) and virtual reality (VR) technologies significantly enhances my engagement with tourist destinations."** 1 – 2 – 3 – 4 – 5 **Question 20: Indicate your level of agreement with the statement: "Smart destination management systems significantly contribute to the safety and security of tourists at destinations."** 1 – 2 – 3 – 4 – 5 **Question 21: How much do smart transportation systems contribute to a stress-free and seamless travel experience for you?** 1 – 2 – 3 – 4 – 5 **Question 22: How much do you believe that smart transportation options (e.g., ride-sharing apps, real-time transit information) positively impact your travel experiences?** 1 – 2 – 3 – 4 – 5		
Customer journey map – Reflective Phase	**Question 23: Smart Tourism technologies help me recollect/ organize memories (photos, videos...).** 1 – 2 – 3 – 4 – 5	Items 23 to 29 following the number of the question: Question 23= Item 23 Question 24= Item 24	Shen, S., Sotiriadis, M., & Zhang, K. (2020b). The Influence of Smart Technologies on Customer Journey in Tourist Attractions within the Smart Tourism Management Framework.

	Question 24: I share experiences through social media (posting photos and videos as content creation). 1 – 2 – 3 – 4 – 5 **Question 25: I make recommendations and suggestions to my close circle of friends and family (word of mouth).** 1 – 2 – 3 – 4 – 5 **Question 26: I write reviews on google and other websites.** 1 – 2 – 3 – 4 – 5 **Question 27: To what extent do you believe that smart technologies contribute to sustainable and eco-friendly practices in the tourism industry?** 1 – 2 – 3 – 4 – 5 **Question 28: How much do smart tourism technologies impact your cultural and social experiences at tourist destinations?** 1 – 2 – 3 – 4 – 5 **Question 29: To what extent do privacy concerns associated with smart tourism technologies impact your trust in using these technologies during your travels?** 1 – 2 – 3 – 4 – 5	Question 25= Item 25 Question 26= Item 26 Question 27= Item 27 Question 28= Item 28 Question 29= Item 29	*Sustainability*, *12*(10), 4157. https://doi.org/10.3390/su12104157 Of own invention Question 27: The usage of smart tourism technologies implies being more sustainable and ecofriendly. Question 28: Smart tourism technologies can help tourists get a more personal experience by suggesting less touristic experiences that interact more with the local culture. Question 29: Nowadays we put our personal information everywhere and some people prefer not using technologies as a way of being more private.
Satisfaction and revisit intention	**Question 30: The quality of smart tourism technologies can enhance my satisfaction with the destination.**	Items 30 to 39 following the number of the question:	Chen, C., & Chen, F. S (2010). Experience quality, perceived value, satisfaction and behavioral intentions for heritage

	1 – 2 – 3 – 4 – 5 **Question 31: How much do personalized mobile apps for travel itineraries and recommendations impact your engagement with local businesses and attractions?** 1 – 2 – 3 – 4 – 5 **Question 32: Please rate the impact of wearable technologies and smart devices on the overall efficiency and enjoyment of your travel experience.** 1 – 2 – 3 – 4 – 5 **Question 33: Indicate your agreement with the statement "The integration of chatbots and virtual assistants in the tourism industry improves my overall satisfaction with customer support".** 1 – 2 – 3 – 4 – 5 **Question 34: Indicate your agreement with the statement: "The gamification of travel experiences through mobile apps and augmented reality enhances my engagement and satisfaction as a traveler."** 1 – 2 – 3 – 4 – 5 **Question 35: I recommend destinations that use smart tourism technologies to my family and friends.** 1 – 2 – 3 – 4 – 5	Question 30= Item 30 Question 31= Item 31 Question 32= Item 32 Question 33= Item 33 Question 34= Item 34 Question 35= Item 35 Question 36= Item 36 Question 37= Item 37 Question 38= Item 38 Question 39= Item 39	tourists. Tourism Management, 31(1), 29-35. https://doi.org/10.1016/j.tourman.2009.02.008 Torabi, Z., Shalbafian, A. A., Allam, Z., Ghaderi, Z., Murgante, B., & Khavarian-Garmsir, A. R. (2022). Enhancing Memorable Experiences, Tourist Satisfaction, and Revisit Intention through Smart Tourism Technologies. *Sustainability*, *14*(5), 2721. https://doi.org/10.3390/su14052721 Zheng, Y., & Wu, Y. (2023b). An investigation of how perceived smart tourism technologies affect tourists' well-being in marine tourism. PLOS ONE, 18(8), e0290539. https://doi.org/10.1371/journal.pone.0290539 Question 31: Some people prefer having a more real experience, meaning that some tourists prefer engaging in not so touristic activities or businesses. Question 32: Some tourists use wearable technologies such smart watches where they can get information or used as a way of payment instead of having to carry a wallet or guides. Question 33: Every touristic page uses a way of customer support like

	Question 36: Destinations that offer smart tourism technologies beyond my expectations make my travel more pleasant. 1 – 2 – 3 – 4 – 5 **Question 37: Smart tourism technologies have helped me personalize my travel experiences.** 1 – 2 – 3 – 4 – 5 **Question 38: The personalization of my travel experience makes me satisfied and creates a better travel experience.** 1 – 2 – 3 – 4 – 5 **Question 39: In the future I will travel to destinations that offer unique experiences via smart tourism technologies.** 1 – 2 – 3 – 4 – 5		chatbots or virtual assistants to whom travelers can ask in case of a problem or doubt. Question 34: Sometimes smart technologies can create a false image of the destination or activity, creating false expectations to the tourists.

Sección 1 de 7

SMART TOURISM TECHNOLOGIES

The goal of this questionnaire is to analyze how smart tourism technologies (STT) affect the tourist douring the customer journey.

Smart tourism technologies refer to the incorporation of information and communication technologies (ICTs) to enhance various facets of the tourism industry, with the goal of providing a more efficient, interactive and personalized experiences for both tourists and industry stakeholders. These technologies leverage data, connectivity and digital solutions to optimize operations, improve customer satisfaction, and create a more intelligent and sustainable tourism ecosystem.

Some key components of smart tourism technologies are:

- Mobile applications that allow access to online information, booking services, etc. These apps can offer personalized recommendations, maps, and location-based services. Some examples are social media, Booking, Skyscanner, translators, etc.
- Social media like instagram, facebook, tiktok, these apps let us interact and enables users to create and share content.
- Internet of things (IoTs) refers to a network of physical devices, appliances and other physical objects that are embedded with sensors, software and network connectivity. Some examples are intelligent sensor lights, programable thermostats, electronic toll collections, smart watches, etc.
- Augmented reality (AR) and virtual reality (VR) are technologies that enhance the tourism experience by providing virtual tours, interactive guides and immersive experiences, so tourist can explore destinations and attractions before they arrive or gain additional information.
- Artificial intelligence (AI) these types of technologies can be used to automate customer service, personalize recommendations and improve decision making processes.
- Geolocalization services are GPS and other technologies that enable real-time tracking of tourists, helping them navigate and discover nearby points of interest.
- Smart payment systems are contactless and mobile payment solutions that simplify transactions for tourists and businesses.

Sección 2 de 7

Demographic information

Descripción (opcional)

Gender? *

- Male
- Female

Age? *

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65+

Sección 3 de 7

Customer journey map - Prospective phase (before traveling)

Rate que questions and sentences from 1 (Strongly disagree) to 5 (Strongly agree)

1. I use smart tourism technologies to search and plan my trips (webs, social media, virtual reality, location-based systems...). *

1	2	3	4	5
○	○	○	○	○

2. I think smart tourism technologies help reducing decision risks when planning a trip. *

1	2	3	4	5
○	○	○	○	○

3. The usage of smart tourism technologies increases my interest in certain destinations or activities. *

1	2	3	4	5
○	○	○	○	○

4. The usage of smart tourism technologies can help me build an understanding of the local culture. *

1	2	3	4	5
○	○	○	○	○

5. To what degree do you feel that artificial intelligence in tourism applications positively influences your decision-making process when planning a trip? *

1	2	3	4	5
○	○	○	○	○

6. On a scale of 1 to 5, how frequently do you use social media platforms (e.g., Facebook, Instagram, Twitter) to research travel destinations or seek recommendations? *

1	2	3	4	5
○	○	○	○	○

Sección 4 de 7

Customer journey map - Active phase (on site / douring)

Rate que questions and sentences from 1 (Strongly disagree) to 5 (Strongly agree)

7. How much do you agree with the statement: "Social media platforms play a significant role in shaping my travel aspirations and desires"? *

1	2	3	4	5
○	○	○	○	○

8. On a scale of 1 to 5, how much do you think social media enhances your overall travel experience (e.g., by facilitating connections with locals, sharing experiences with others)? *

1	2	3	4	5
○	○	○	○	○

9. To what extend does real-time information sharing through social media and other platforms impact your behavior and decision making during your travels? *

1 2 3 4 5

10. Smart tourism technologies facilitate navigation and communication while on destination: *

1 2 3 4 5

11. Please rate your level of reliance on location-based services (e.g., Google Maps, Yelp) during your travels. *

1 2 3 4 5

12. Indicate the level of agreement with the statement "Location based services provided by smart tourism technologies significantly improve my ability to explore and discover new destinations". *

1	2	3	4	5
○	○	○	○	○

13. To what extent do you find smart hotel features (e.g., automated check-in/out, keyless entry) convenient during your stays? *

1	2	3	4	5
○	○	○	○	○

14. Smart tourism technologies enhance convenience and speed while on destination: *

1	2	3	4	5
○	○	○	○	○

15. Smart tourism technologies help me make short term decisions while on destination: *

1	2	3	4	5
○	○	○	○	○

16. Smart tourism technologies enhance flexibility, engagement and enjoyment while on destination: *

1	2	3	4	5
○	○	○	○	○

17. Rate the convenience of using smart payment systems and digital wallets for financial transactions during your travels. *

1	2	3	4	5
○	○	○	○	○

18. Rate the effectiveness of real-time translation services in smart devices in improving communication during your travels? *

1	2	3	4	5
○	○	○	○	○

19. Indicate your level of agreement with the statement: "The use of augmented reality (AR) and virtual reality (VR) technologies significantly enhances my engagement with tourist destinations." *

1	2	3	4	5
○	○	○	○	○

20. Indicate your level of agreement with the statement: "Smart destination management systems significantly contribute to the safety and security of tourists at destinations." *

1	2	3	4	5
○	○	○	○	○

21. How much do smart transportation systems contribute to a stress-free and seamless travel experience for you? *

1	2	3	4	5
○	○	○	○	○

22. How much do you believe that smart transportation options (e.g., ride-sharing apps, real-time transit information) positively impact your travel experiences? *

1	2	3	4	5
○	○	○	○	○

Sección 5 de 7

Customer journey map - Reflective phase (After traveling)

Rate que questions and sentences from 1 (Strongly disagree) to 5 (Strongly agree)

23. Smart Tourism technologies help me recollect/ organize memories (photos, videos...). *

1	2	3	4	5
○	○	○	○	○

24. I share experiences through social media (posting photos and videos as content creation). *

1	2	3	4	5
○	○	○	○	○

25. I make recommendations and suggestions to my close circle of friends and family (word of mouth). *

1	2	3	4	5
○	○	○	○	○

26. I write reviews on google and other websites. *

1	2	3	4	5
○	○	○	○	○

27. To what extent do you believe that smart technologies contribute to sustainable and eco-friendly practices in the tourism industry? *

1	2	3	4	5
○	○	○	○	○

28. How much do smart tourism technologies impact your cultural and social experiences at tourist destinations? *

1	2	3	4	5
○	○	○	○	○

29. To what extent do privacy concerns associated with smart tourism technologies impact your trust in using these technologies during your travels? *

1	2	3	4	5
○	○	○	○	○

Sección 6 de 7

Satisfaction and revisit intention

Rate que questions and sentences from 1 (Strongly disagree) to 5 (Strongly agree)

30. The quality of smart tourism technologies can enhance my satisfaction with the destination. *

1	2	3	4	5
○	○	○	○	○

31. How much do personalized mobile apps for travel itineraries and recommendations impact your engagement with local businesses and attractions? *

1	2	3	4	5
○	○	○	○	○

32. Please rate the impact of wearable technologies and smart devices on the overall efficiency and enjoyment of your travel experience. *

1	2	3	4	5
○	○	○	○	○

33. Indicate your agreement with the statement “The integration of chatbots and virtual assistants in the tourism industry improves my overall satisfaction with customer support”. *

1	2	3	4	5
○	○	○	○	○

34. Indicate your agreement with the statement: "The gamification of travel experiences through mobile apps and augmented reality enhances my engagement and satisfaction as a traveler." *

1	2	3	4	5
○	○	○	○	○

35. I recommend destinations that use smart tourism technologies to my family and friends. *

1	2	3	4	5
○	○	○	○	○

36. Destinations that offer smart tourism technologies beyond my expectations make my travel more pleasant. *

1	2	3	4	5
○	○	○	○	○

37. Smart tourism technologies have helped me personalize my travel experiences. *

1	2	3	4	5
○	○	○	○	○

38. The personalization of my travel experience makes me satisfied and creates a better travel experience. *

1	2	3	4	5
○	○	○	○	○

39. In the future I will travel to destinations that offer unique experiences via smart tourism technologies. *

1	2	3	4	5
○	○	○	○	○

Después de la sección 6 Ir a la siguiente sección

Sección 7 de 7

THE END !

THANK YOU SO MUCH FOR PARTICIPATING AND ANSWERING THE QUIESTIONNAIRE.