

The Role of Smart Tourism Technologies towards Destinations' Loyalty and Positive Word-of-Mouth: A Perspective through SOR Theory

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- Compile the theoretical information about Smart Tourism Technologies being used in tourism industry and its impacts.

II. Practical Part

- Analyze the development of tourism industry in Istanbul.
- Analyze the relationships between Smart Tourism Technologies, Tourists' Experiences, Satisfaction, Word-of-Mouth and Loyalty.
- Extract practical implications from data analysis.
- Provide recommendations to Destination Management Organizations and other stakeholders to develop related technological innovations.

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ABSTRAKT

Více turistických destinací využívá chytré technologie, aby přilákalo více turistů a zlepšilo spokojenost s cestováním. Zvýšení konkurenceschopnosti, zlepšení nabídky cestovního ruchu, zajištění bezproblémové zákaznické zkušenosti a zlepšení udržitelnosti jsou některé z hlavních cílů, které turistické destinace v těchto dnech sledují. Mezi další cíle patří vytvoření silné digitální transformace s pomocí chytrých technologií. Cestovatelé stále častěji vyhledávají destinace, které poskytují vysokorychlostní internet, flexibilní možnosti rezervace nebo dokonce útulné pracovní prostory pro práci na dálku v zahraničí. Z turistického hlediska mohou digitální řešení díky snadnosti a pohodlí podporovat rozhodovací proces a životní cyklus turistických zážitků, podporovat realizaci aktivit souvisejících s cestováním a obohacovat kulturní zážitky z cestování. V důsledku toho mají informační a komunikační technologie významný dopad v našem uspěchaném světě.

Tato studie představuje unikátní koncepční rámec založený na teorii stimulu-organismu-odezva (SOR) využívající metodu průzkumu sběrem dat od 154 turistů a Modelování strukturálních rovnic metodou nejmenších čtverců (PLS-SEM) jako metodologii pro analýzu dat. V této diplomové práci je zakotvena teorie SOR, atributy technologií chytrého cestovního ruchu (tj. informace, dostupnost, interaktivita a personalizace) jako stimuly, vnímaná hodnota technologií chytrého cestovního ruchu a spokojenost s turistickým zážitkem jako interní reakce, stejně jako loajalita a ústní sdělení jako konečná reakce. Dále z kontextuálního hlediska se tato diplomová práce pokouší zjistit, jak dobře Istanbul zapadá do konceptu chytré turistické destinace s pomocí technologií chytrého cestovního ruchu. Proto jsou vysvětleny pojmy chytrá turistická destinace a chytré město a diskutována aplikace technologií chytrého turismu v Istanbulu.

Výsledky diplomové práce naznačují, že atributy technologií chytrého cestovního ruchu pozitivně ovlivňují vnímané hodnoty zkušeností s technologiemi chytrého cestovního ruchu a spokojenost s turistickými zkušenostmi s výslednými dopady pozitivních ústních projevů a loajality. Výsledky poskytují pohled na transformační potenciál technologických řešení v destinacích chytrého cestovního ruchu pro utváření postojů a chování turistů a ukazují praktické důsledky pro společnosti zabývající se managementem destinací a vývoj účinných strategií pro zlepšení zážitků z cestovního ruchu.

Klíčová slova: technologie chytrého turismu, chytrá turistická destinace, spokojenost s turistickým zážitkem, ústní sdělení, loajalita, teorie SOR

ABSTRACT

Smart technologies are being incorporated by more locations to attract more visitors and enhance tourist satisfaction. Increasing competitiveness, enhancing tourism offerings, providing a smooth customer experience, and improving sustainability are some of the major goals tourism destinations are following these days. Other goals include forging a powerful digital transformation with the help of smart technologies. Travelers increasingly look for destinations that provide high-speed internet, flexible booking options, or even cozy workspaces for remote working abroad. From a tourist perspective, due to the ease and convenience digital solutions can support the decision-making process and lifecycle of tourism experiences, support the implementation of travel-related activities, and enrich cultural travel experiences. Consequently, information and communication technologies have significant impacts in our fast-paced world.

Based on the Stimulus-Organism-Response (SOR) theory, this master's thesis presents a new conceptual framework using a survey method by collecting data from 154 tourists and Partial Least Squares-Structural Equation Modeling (PLS-SEM) as a methodology for data analysis. In this master's thesis, anchoring SOR theory, smart tourism technologies attributes (i.e. information, accessibility, interactivity and personalization) as stimuli, perceived value of smart tourism technologies and tourist experience satisfaction as internal responses, as well as loyalty and word-of-mouth as the ultimate response. Further, from the contextual perspective, this master's thesis investigates how well Istanbul conforms to the notion of a smart tourism destination. Therefore, the concepts of a smart tourism destination and smart city are explained and the application of smart tourism technologies in Istanbul is discussed.

Results of the master's thesis indicate that the smart tourism technologies attributes positively influence the perceived values of smart tourism technologies experience and tourist experience satisfaction with resulting impacts of positive word-of-mouth and loyalty.

The findings shed light on how technological advancements in smart tourist locations can influence visitors' attitudes and behaviours in a transformative way. It also has practical implications for destination management firms and the creation of winning marketing strategies that enhance visitor experiences.

Keywords: smart tourism technologies, smart tourism destination, tourist experience satisfaction, word-of-mouth, loyalty, SOR theory

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I hereby declare that the print version of my Bachelor's/Master's thesis and the electronic version of my thesis deposited in the IS/STAG system are identical.

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INTRODUCTION

Information and communication technology is changing how cities will operate in the future while promoting efficiency, public safety, economic growth, and quality of life. Among the main objectives that cities are embracing today are strengthening their digital transformation with the assistance of smart technology, enhancing sustainability, transport networks and social impact. On parallel lines, information and communication technologies have a big influence on tourism spots to create convenience and give memorable experiences. These are all necessary to boost competitiveness, enhance tourism offerings, and provide quality customer experiences.

The World Tourism Organization (UNWTO, 2024) states that the tourism sector was among the first to adopt information and communication technologies. The integration of smart technologies into various tourism strategies greatly enhances the effectiveness of business goals and objectives enabling a deeper understanding of customer choices and better service (Ari, 2022). In light of this trend, a large number of tourism businesses are putting various smart technologies into practice to promote their destinations (Ari, 2022). To develop smart tourism destinations, governments and destination management organizations (DMOs) often create rating systems that align with smart city guidelines (Pai et al., 2020). Research on smart tourism technologies carried out in various cities previously explained that these technologies have produced happy and memorable travel experiences (Jeong, Shin, 2020; Chung et al., 2021; Pai et al., 2020; Shen et al., 2020). In my earlier research it was found that perceived smart tourism technologies experience had a significant influence on the travel experience satisfaction (Ari, 2022).

From a tourist perspective, smart technologies play an integral role throughout the entire journey (Pai et al., 2020). Most travelers use smart technology including travel websites and apps, social media, as well as location-based queries, restaurant reviews, and mobile wallet payments with their smartphones (Pai et al., 2020). Precisely, in this survey, tourists are required to share their experience of using smart tourism technologies to provide convenience, such as in maps and guide, payment systems, transportation systems, tour bookings, virtual tours, query systems, recommendations, and digital kiosks, by following the approach of Balakrishnan et al. (2023).

Internationally recognized travel destinations like Istanbul must now effectively apply digital transformation and smart tourism ideas to compete with most popular destinations across the world (Ari, 2022).

To sum up, this study aims to expand the literature in two ways: (1) to create a model with the SOR theory that includes smart tourism technologies attributes such as information, accessibility, interactivity and personalization as stimuli (S), perceived value of smart tourism technologies and tourist experience satisfaction as organism (O), and loyalty and word-of-mouth as response (R) to investigate their connections in Istanbul's smart tourism background, and based on results (2) to ascertain the best ways in which destination managers can employ smart technologies to draw tourists and preserve a long-lasting competitive advantage. A new theoretical model proposed to achieve these answers of above-mentioned scenarios. The study was carried out by collecting data through survey method from the tourists, who visited Istanbul, Türkiye, a popular urban tourist destination. Moreover, the application of SOR theory to a smart tourism destination is significant as it has been used in a setting where technology and tourism are combined. The findings of the research cannot be generalized as travelers from different countries have varying experiences and the level of familiarity with smart tourism technologies.

This master's thesis aims to show if Istanbul is perceived by tourists as a leading smart city tourism destination by its tourism related technological innovations. The primary goal of this thesis is to find out how the utilization of smart tourism technologies promotes the perceived value of smart tourism technologies and tourist experience satisfaction, and also positive word-of-mouth and loyalty. Our research questions are:

RQ1: What attributes of smart tourism technologies (i.e. information, accessibility, interactivity and personalization) influence the perceived value of smart tourism technologies?

RQ2: What attributes of smart tourism technologies (i.e. information, accessibility, interactivity and personalization) influence the tourists' experience satisfaction?

RQ3: What is the influence of perceived smart tourism technologies on tourist experience satisfaction in Istanbul, Türkiye?

RQ4: What is the influence of perceived smart tourism technologies on word-of-mouth and loyalty in Istanbul, Türkiye?

RQ5: What is the influence of tourist experience satisfaction on word-of-mouth and loyalty in Istanbul, Türkiye?

An empirical study was carried out in Istanbul, Türkiye to investigate tourist perception of the attributes of smart tourism technology, perceived value of smart tourism technologies attributes, tourist experience satisfaction, along with the word-of-mouth and loyalty.

OBJECTIVES AND METHODS OF MASTER THESIS PROCESSING

This master's thesis aims to investigate the role of smart tourism technologies attributes, its impact on perceived value of smart tourism technologies as well as tourist experience satisfaction, and whether it leads to positive word-of-mouth and loyalty.

In order to fulfill these objectives, this study first lays out the theoretical framework for the investigation and provides prior definitions of the key terms related to the tourism industry in Türkiye, smart tourism destination, smart tourism applications utilized in Istanbul and a review of the literature on the attributes of smart tourism technologies, including informativeness, accessibility, interactivity and personalization, as well as the perceived value of these technologies, tourist experience satisfaction, word-of-mouth and loyalty followed by the research questions.

The purpose of this master's thesis is to advance and examine a comprehensive conceptual framework by anchoring SOR theory as a theoretical lens to explain the impact of smart tourism technologies attributes (stimuli) affecting tourist loyalty and positive word-of-mouth (response) via the perceived value of smart tourism technologies and tourist experience satisfaction (organism) which help to develop positive behavioral intentions. The focus is on how these factors affect the perceived value and satisfaction gained from using tourism-related applications, and consequently, how they affect loyalty and positive word-of-mouth towards the destination.

The second chapter provides a description of the research model and hypotheses that were used to address the research questions, which is followed by a chapter outlining the data and research methodology. A quantitative analysis based on empirical data gathered from tourists and the research methodology is presented in the third chapter, and empirical partial least square structural equation modelling (PLS-SEM) findings are shown in the fourth chapter. The final chapter offers guidelines, recommendations, and solutions based on research results and past experience regarding alternate routes and solutions to common issues in the digitalization and technological innovations of the tourism industry. Consequently, this study offers a fresh viewpoint to the tourism related literature that might have significant practical implications for destination management organizations and development of successful initiatives that raise the level of tourist satisfaction and behavioral intentions towards smart tourism destinations. For the study, a sample of tourists visiting Istanbul, one of the most popular urban tourist destinations worldwide, was utilized.

I. THEORY

1 THEORETICAL FRAMEWORK

1.1 Tourism in Türkiye

The World Travel and Tourism Council (WTTC) has been assessing the economic impact of travel and tourism for several decades. It has highlighted the sector's importance to the global economy as it fosters social and economic advancement, reduces poverty, creates jobs and has a significant positive social impact, including unique opportunities to women, minorities, and young people (World Travel & Tourism Council, 2021). The tourism industry influences a variety of sub industries from transportation services such as airlines, rail companies and car rentals to the production and distribution of leisure goods (Ari, 2022). It is defined by the products and services that make traveling possible.

The economy of Türkiye depends significantly on tourism. Its Mediterranean climate, along with cultural and historical treasures, invites the visitors from all around the globe (Ari, 2022). Numerous tourist attractions in Türkiye are influenced by both the West and the East because of its location between Southeastern Europe and Western Asia. Ancient civilizations such as Hittites, Phrygians, Lydians, Persians, Greeks, Romans, Seljuks, and Ottomans have resided in the area that is now Türkiye for more than ten millennia, which led to remarkable blend of cultures with a wide range of influences (Ari, 2022). The Mediterranean, Aegean, and Black Seas encircle Türkiye. Its location is significant geographically because the Marmara Sea, the Bosphorus, and the Dardanelles divide the border between Thrace and Anatolia as well as between Europe and Asia (Ari, 2022).

According to the Ministry of Culture and Tourism of Türkiye, Türkiye ranks third around the world with 551 blue flag beaches as well as 23 marinas, 14 tourism boats and 10 private yachts (Hurriyet Daily News, 2023). The Foundation for Environmental Education (FEE), a non-profit organization with its headquarters in Copenhagen, awards certifications known as the Blue Flag a beach, marina, or sustainable boating/sailing tour provider that satisfies environmental standards.

There are 21 World Heritage Sites in Türkiye as of 2023 (UNESCO, 2023). The first three Turkish sites, Great Mosque and Hospital of Divriği, Historical Areas of Istanbul and Göreme National Park and the Rock Sites of Cappadocia, were added to the list during the World Heritage Committee's 9th Session, which took place in Paris, France in

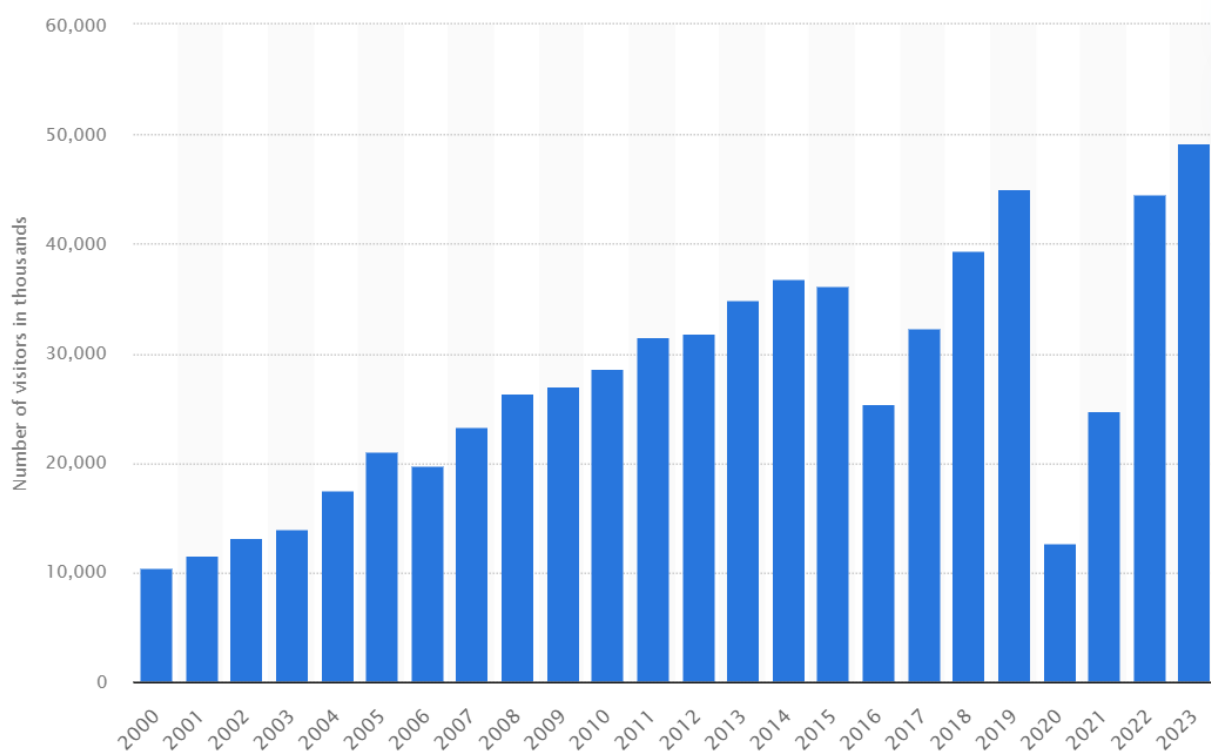
1985 (UNESCO, 1985). The list was updated in 2023 with the most recent inscriptions including Gordion and Wooden Hypostyle Mosques of Medieval Anatolia.

Every year, Türkiye sees an increase in the number of visitors with very few exceptions. Due to the Syrian crisis and the ensuing terrorist danger, there was a significant decline in travel in 2016. However, the tourism industry did miraculously revive despite all the odds; in 2017 travelers returned to Türkiye, and in 2019 the number reached a record high (Statista, 2022). Additionally, the COVID-19 epidemic kept the number of tourists much below average in 2020, as it did in practically every country. The lockdowns and social distancing measures have caused a significant reduction in mobility, which has caused a slowdown in the tourism service industry (Ari, 2022). In 2021, there were 30 million foreign tourists in Türkiye, an 88% increase over 2020 pandemic period.

Türkiye entered the top five worldwide travel destinations in 2021 thanks to the relative strength of its foreign tourist industry. Russia (15.6% of all inbound tourism) was the leading source market, followed by Germany (10.3%), Ukraine (6.8%), and Bulgaria (4.7%) (OECD, 2022). According to Ministry of Culture and Tourism of Türkiye, there were more than 56.7 million visitors in 2023 (Travel Economic Times, 2023).

According to OECD, 2022, revenue from tourism reached USD 41.3 billion in 2019, representing 5.4% of GDP. 2.3 million workers, representing 8.1% of the workforce, were employed in the tourism industry. In 2021, the employment percentage of tourism fell to 6.6% of total employment. 2020 saw a 67% decline in tourism-related revenue to USD 13.6 billion, and a 1.9% decline in tourism's share of the national GDP (OECD, 2023). Tourist receipts hit USD 28.6 billion in 2021, up 110% over the previous year and contributing 3.5% to the country's GDP.

According to the World Travel & Tourism Council's (WTTC) prediction by 2032, tourism sector could account for almost TRY 1,036 billion (US\$117 billion) of the country's GDP, or 11% of the entire economy (WTTC, 2022). It is also expected to create more than 716,000 new jobs in the tourism sector over the next decade. The tourism sector is in greater need than ever of innovative technologies since many aspects of the industry have been forced to slow down. Achieving continuous tourist activities and maintaining the digitalization of the whole tourism industry are crucial for Türkiye to boost its tourism-related revenue and move up the global competitive scale.



Source: Statista (2024)

Figure 1. Figure 1. International tourism, number of arrivals in Türkiye

Although Istanbul is not the capital of Türkiye, it is the country's largest city and is among the world's fastest-growing metropolitan areas. The population of the metropolitan area was only 1 million fifty years ago, it has skyrocketed to 16 million since then (Macrotrends, 2024). Istanbul, whose districts are split by the Bosphorus strait between the Black Sea and the Sea of Marmara, is the most visited city in Türkiye by foreign tourists (Ari, 2022). Istanbul is a transcontinental city, with its commercial center situated in Europe and the remaining part of the city in Asia (Statista, 2023). Three bridges connect the European and Asian sides. According to Euromonitor International research, in terms of international arrivals, Istanbul, Türkiye ranked first in 2023 and Antalya, Türkiye is fourth (Euromonitor, 2023). The city welcomed 20.2 million tourists in 2023, representing a 26% increase from 2022 (CNBC, 2024).

The following must-see attractions and historical landmarks in Istanbul include Hagia Sophia, Blue Mosque, Grand Bazaar, the Spice Bazaar, Topkapi palace, Galata Tower, Dolmabahce Palace, Maiden's Tower, Basilica Cistern, Rumeli Fortress and many others (Ari, 2022). These kinds of attractions are the main drivers of the city's tourist industry,

placing Istanbul, as of June 2021, among the cities with the greatest abundance of cultural attractions in the world (Statista, 2021). In addition to its abundance of cultural offerings, the city attracts visitors at a lower cost than other popular European locations. Istanbul was one of the most reasonably priced cities in Europe to go backpacking as of March 2022 (Statista, 2022).

Based on our analysis of the statistics, it is clear that one of the Turkish economy's most dynamic and rapidly expanding industries to be developed is definitely tourism.

1.2 Smart Tourism Destination and Smart City

A smart tourism destination is one that gathers data from both digital and physical sources and uses cutting-edge technology to deliver experiences and value propositions that prioritize sustainability, efficiency, and enhancing the visitor experience (Gretzel et al., 2015; Nieves-Pavón et al., 2023). Leveraging technology infrastructure to maximize resource management, boost competitiveness, and guarantee tourists' long-term happiness is the main objective of smart tourism technologies (Buhalis, Amaranggana, 2015). The use of beacons to deliver location-based information on smartphones, online data analytics to improve destination branding, and the creation of customized routes close to medical facilities for people with particular health needs are a few examples of initiatives in smart tourism destinations (Nieves-Pavón et al., 2023)

The fourth industrial revolution has resulted in rapid advancement of technology and digital transformation, which defines a substantial shift in the organizational structure (Ari, 2022). The advent of smart technology in the industrial sector began with the fourth industrial revolution and has since spread to the tourist industry. By applying technology to improve visitor experiences, smart tourist destinations are completely changing the travel industry. The word "smart" has been used to describe tourism because of the remarkable accomplishments that have been made possible by the integration of real-time data, integrated technology, and physical infrastructure into a complex ecosystem (Pai et al., 2020). The goal of smart tourism is to completely satisfy visitors' demands with regard to dining, lodging, transportation, shopping, and entertainment (Ari, 2022). For example, many cultural heritage sites use automated translators and self-guides to assist tourists in understanding historical and cultural information (Xiong et al., 2023). It is seen as being customer centric. The primary objective of smart tourism, which is characterized by the integration of smart technologies and tourism resources, is to improve the tourist experience

and boost resource management to maximize destination competitiveness and visitor loyalty while also guaranteeing long-term sustainability (Gretzel et al., 2015). Tourism industry has witnessed a dramatic change in consumer behavior over the last 20 years as a result of the extensive adoption of information and communication technologies (Buhalis, Amaranggana, 2015; Neuhofer et al., 2015; Shen et al., 2020). By integrating cutting-edge technologies into smart tourism destinations, destination managers can raise the quality of the visitor experience and the destinations' competitiveness (Jeong, Shin, 2020). Consequently, tourism industry depends on smart tourism destinations, facilitating cities unique opportunities to be the destinations of choice for both domestic and international travelers (The Smart City Journal, 2019). In addition to utilizing information and communication technologies, travelers, destination management companies, and other industry stakeholders can interact more easily in an ecosystem known as "smart tourism," which eventually leads to the co-creation of value between providers and travelers (Pai et al., 2020).

Nowadays, tourists are self-sufficient, engaged individuals who produce, share and attempt to influence others. They frequently have different needs and character traits, lack sufficient experience, and know very little about the destinations they visit for vacation. Mobile devices, social media and apps are now much more than just a tourist's information source in this smart environment (Ari, 2022). The widespread use of mobile technologies, applications, smart devices, and location-based services is the primary factor that has shaped the smart tourist (Shen et al., 2020). Smart tourism technologies therefore assist travelers in integrating content and enhance their decision-making. Travelers who are more informed and involved are actively engaging with the destinations they are visiting, working together to create tourist attractions that add value (Neuhofer et al., 2015). It is critical to remember that smart technologies support both the sustainable growth of tourist destinations and their ability to compete (Ari, 2022).

Most academic research concerning smart tourism and smart tourism destinations is centered around the significance of expanding the tourism sector and collaborating to create events that boost the visitor experience (Buhalis, Amaranggana, 2015). With the help of Internet of Things and cloud computing, smart tourism destinations serve as the hub for tourism-related objects and data resources. Their goal is to increase visitor awareness by utilizing recognition and control techniques (Acar et al., 2019). To improve service quality provided to tourists, support tourism management, and grow the industry, smart tourism destinations really make sense in integrating ICT with irrational beliefs and prioritizing the needs of visitors.

Smart cities and smart tourism in particular are the sources of the concept of smart tourism destinations. In addition to digital entrepreneurship and smart communities serving as supportive components, it encompasses e-commerce, and ICT-enabled new products, services, and business models (The Smart City Journal, 2019). The goal of smart cities and smart tourism destinations is to raise the standard of living and make them more appealing to all parties involved, including locals and tourists (Buhalis, Amaranggana, 2015)

According to Chung et al. (2021), smart cities are places where urban life and tourism converge. Smart tourism cities are therefore a hybrid of smart cities and smart tourism. Applications like Google Maps, transportation (like Uber, BlaBlaCar), and lodging (like Airbnb) are crucial in improving the smartness and accessibility of the city by facilitating interaction between visitors and locals and assisting in the conversion of regular homes or vehicles into tourist attractions. "An innovative sustainable tourism destination that fosters and enriches visitor interactions with experiences at their destination, ultimately elevating the standard of living for locals" is how smart tourism cities defined (Ari, 2022).

According to Acar et al. (2019), a smart city is one in which information and communication technologies are incorporated into conventional infrastructure through the application of technological advancements. The word "smart" in this sense refers to digital, integrated, green, sustainable, and intelligent. Pillars of smart cities are smart mobility, smart living, smart environment, smart economy, smart people, and smart governance; the ultimate goal is to provide future generations with a sustainable, high-quality life (Buhalis, Amaranggana, 2014)

Chung et al. (2021) list enhanced quality of life, sustainability, eco-friendliness, increased efficiency, and connectivity through information and communication technologies as characteristics of smart cities. To guarantee the well-being of its inhabitants, smart cities endeavor to enhance urban governance and organizational frameworks, as well as recognize and address prevalent issues concerning urban infrastructure, transportation, risks, hazards, urban mobility, waste management, water and energy supply, and other related concerns (Ari, 2022). Smart cities accomplish their objectives and enhance transparency and customer satisfaction by utilizing information and communication technologies and management systems effectively. According to Acar et al. (2019), residents of smart cities engage in high levels of interaction via effective communication networks that facilitate access to vital services like education, healthcare, sustainable environments, tourism, and infrastructure.

Travelers' experiences of cities and new places are being completely transformed by smart technologies and applications. The primary idea is that the key to realizing the smart city's full potential and getting ready for the future of tourism lies in smart infrastructure.

Istanbul will gain international attention and undoubtedly become more competitive if the concept of smart technology is integrated into all aspects of governance (Ari, 2022).

1.3 Smart City Initiatives in Istanbul

Türkiye is being forced to enter the smart city ecosystem quickly due to its rapid urbanization. Istanbul's identity as the "capital of civilizations" has given it a rich cultural heritage of three great empires, including the Roman, Byzantine, and Ottoman empires. Due to its unique status as a center of culture and history and significance on a national and international scale, it is imperative that its distinct identity be preserved through accurate policies and strategies. Smart applications have already been implemented in many cities of Türkiye, especially in the areas of transportation and urban services. Istanbul is a city that has made progress in recent years. Research on smart city in Istanbul is still limited. Istanbul has been actively working on various smart city projects to improve urban infrastructure, transportation, sustainability, and citizen services. Some common smart city initiatives in Istanbul include the implementation of smart transportation systems, digitalization of public services, smart energy management, and the use of IoT technologies for urban planning which will be discussed further in this chapter.

There are a few congresses and exhibits held on the topic of smart city in Türkiye. For the first time, World Smart Cities Congress and Exhibit (Smart City Expo Istanbul 2016) had been held outside of Barcelona in Istanbul Halic Congress Center on 1-3 June 2016 (Smart City Expo Istanbul, 2016). In the congress and exhibit, a new generation of solutions created by the top cities and businesses worldwide showcased smart, sustainable, and solution-focused urban applications. In order to create a smart city, Istanbul in particular implemented some advances in the areas of traffic, transportation, and social issues. In addition, International Istanbul Smart Grid and Cities Congress and Exhibit was held in Istanbul several times. It demonstrates Istanbul's sincere desire and efforts to become a smart city.

The local governments in Istanbul, both metropolitan and districts, are primarily responsible for implementing, coordinating and monitoring the smart city initiatives. Istanbul's population is expanding quickly, posing a number of urban challenges including energy,

transportation, infrastructure, and pollution. The Istanbul Metropolitan Municipality (IMM) believes that one effective way to deal with these issues is to adopt the notion of a smart city. The eight primary activities that make up urban life, according to Istanbul Metropolitan Municipality, are smart economy, smart life, smart people, smart environment, smart mobility, smart healthcare, smart governance, and smart security (Ari, 2022). A smart city continuously monitors streets, people and objects, while also gathering, analyzing and using data from websites, social media, smart phones, websites etc. In 2015, the Istanbul Metropolitan Municipality initiated the "Smart City Istanbul", a comprehensive smart city transformation project, in collaboration with subsidiary companies like Istanbul Information Technologies and Smart City Technologies Inc. (ISBAK). Numerous governmental and private organizations, local communities, universities, non-governmental organizations, and communities are involved in the project.

ISBAK outlines the goal of a smart city as “improving the quality of life, more productive and efficient use of resources, use of technology, interaction with all stakeholders in the city to achieve a sustainable city.” ISBAK lists the main themes of the smart city initiative as follows: sustainable productivity, urban entrepreneurship, a skilled workforce, and an attractive destination image. ISBAK works to move Istanbul closer to the future and implement projects to improve the quality of life of Istanbulites and millions of visitors each year due to competition, sustainability and livability (Daily Sabah, 2017).

According to ISBAK, "Smart City" works as a journey rather than a project. By providing globally competitive, environmentally friendly, and creative smart city technology solutions, ISBAK hopes to aid in the creation of happy cities (ISBAK, 2021). The most important indicators of a smart city are increased citizen participation, local economic growth, flexible governance, data-driven urban governance, and GDP growth from tourism industry (Ari, 2022). These are all achieved through the comprehensive urban framework that a smart city provides. Istanbul has developed a smart city vision under the transformation project, which aims to make the city the smartest in the world by 2029 by improving the quality of life through a combination of strategic goals, a smart city roadmap, and other initiatives (Ari, 2022).

Tourism is one of the most vibrant and quickly expanding industries of the Turkish economy (Ari, 2022). In order to establish Istanbul as a Smart City Tourism Destination, it seeks to consider the requirements, desires, and expectations of both locals and tourists. Istanbul has

always required development and financing in order to handle the entire municipal work system and solve issues. The effectiveness of smart city applications depends on citizens' ability to use technology as a means to enhance their standard of living (Ari, 2022).

To achieve sustainable development goals and turn the municipality into a smart city, a number of projects have been started by the municipality. These projects include Smart City Technology and Applications, Intelligent Lighting Systems, Intelligent Transportation Systems, Transportation Planning and Geographical Information Systems, Maintenance & Repair Services, Intelligent Camera and Security Systems, National and International Consultancy and Planning Services, and Fleet Management Systems (ISBAK, 2021).

ISBAK has already finished overseeing the management of fiber-optic broadband network and the operation of "IBB Wi-Fi Wireless Communication Service" hotspots, which are provided by the municipality at no cost to residents and visitors in numerous locations throughout the city (Ari, 2022).

Istanbul Municipality won the Telecoms World Awards 2020 with IBB Wi-Fi Wireless Communication Service, and first place in the Smart Cities category (Sezer, 2021). Because the internet infrastructure in the metro is essential for residents' transportation, particularly in the event of emergencies, earthquakes, etc., residents of Istanbul started using free internet services in the metro lines (Sezer, 2021).

IMM Data Center was established to offer ongoing data protection, and also to combine data and documents from its 28 subsidiaries (Ari, 2022). Consequently, by preventing the duplication of information technology investment costs, opportunities are created for large savings and productivity improvements (ISTTELEKOM, 2020). Istanbul Metropolitan Municipality is committed to uninterrupted digital transformation and makes sure that all files and paper documents—both current and historical— are suitable for the technologies used in digital archiving transformation (ISTTELEKOM, 2020).

Istanbul Metropolitan Municipality (IMM) and Arup collaborated to develop the Istanbul Sustainable Urban Mobility Plan (SUMP) from September 2019 to March 2022. The programme was part of the Global Future Cities Programme (GFCP), which was administered by the UK Foreign, Commonwealth & Development Office (FCDO) together with UN-Habitat (EU Urban Mobility Observatory, 2022). IMM Mayor Ekrem İmamoğlu introduced the idea to the public on March 28, 2022. Placing people, accessibility, and public engagement at the core of the planning process with the goal of enhancing everyone's quality of life ushers in the development of the city's transport system. Additionally, the scope, context, ambition, and initiatives at the expected level of the Istanbul SUMP are all in line with Sustainable Development Goals (SDGs).

Istanbul also became part of the European Bank for Reconstruction and Development (EBRD) Green Cities Initiative in 2021 (EBRD Green Cities, 2021). By adhering to the Green City Action Plan (GCAP), the city can revitalize its urban landscape and create a green and sustainable vision. Major infrastructure projects have also altered the tourist scene, and it is anticipated that these changes will persist in ongoing initiatives to enhance the city's urban mobility situation. Additionally, Istanbul has been chosen as one of the Mission Cities to take part in the EU Mission to create "100 climate-neutral and smart cities by 2030" (Europe Commission, 2022).

For a sustainable future, the plan builds a human-centered transportation system that is in line with Istanbul's particular geography and historical values. Megaprojects like the completed "Istanbul New Airport," "Yavuz Sultan Selim Bridge" - the third bridge across the Bosphorus, "Marmaray Tunnel," which is an underwater railway tunnel connecting Istanbul's European and Asian shores, and the "Eurasian Tunnel," which is a road tunnel beneath the Bosphorus that connects the two shores, are all intended to improve the deteriorating traffic conditions and facilitate travel across the Bosphorus strait, which is also crucial for the tourism experience (Ari, 2022; Acar et al., 2019).

Urban transportation problems, such as locating information about public transportation schedules, rates, and locations to purchase smart cards (which are used in all forms of transportation) and becoming trapped in heavy traffic on the way to well-known tourist attractions, are inconveniencing not only locals, but also newcomer tourists (Ari, 2022; Acar et al., 2019). Istanbul offers modern applications that facilitate smart mobility. These include mobile apps, talking roads, talking vehicles, smart bus stops, information points at bus stops

for disabled people carrying cards, smart traffic signal systems, adaptive traffic management systems, emergency management centers, traffic control centers, electronic enforcement systems, smart parking management systems, automated car parking payment systems, and public transportation camera systems (Ari, 2022; Dener, 2018).

The city is striving to improve transportation accessibility, road safety, healthcare, and reduce greenhouse gas emissions and traffic congestion through the implementation of sustainable transportation initiatives (Ari, 2022). Notable examples of this progress include the establishment of pedestrian zones, world-class sustainable bus rapid transit (BRT), and a strong demand for improved cycling infrastructure (Ari, 2022). In March 2007, BRT system which is called “Metrobus” was launched in Istanbul (UNFCCC, 2023). It has been reported that Istanbul BRT benefits the environment. 52 minutes a day were saved in travel time for each person. There will be fewer traffic jams and accidents on the D-100 highway when there are fewer cars on it. Public transportation uses 242 tons less fuel per day. 80,000 cars are reportedly removed from the road each day, which reduces CO₂ by 623 tons, nitrous oxide by 282 tons, and hydrocarbons by 25 tons per day. These pollutants are responsible for global warming, smog, acid rain, and significant health issues (Ari, 2022; Can Cengiz, 2017).

Nevertheless, a comprehensive mobile app that incorporates all forms of transportation—bus, taxi, metro, metrobus, tram, ferry—and also information on parking lots, traffic and alternate routes facilitate visitors' navigation of Istanbul's intricate and winding streets (Ari, 2022; Acar et al., 2019). IETT (Istanbul Electricity, Tramway and Tunnel General Directorate), Istanbul's bus operator, provides a smartphone app called "MobiETT," which gives users instant access to real-time information on bus stops' locations, schedules, and expected arrival times on a city map (Ari, 2022). Via displays at stops, passengers can view seat occupancy rates. Also, bus drivers are notified when a disabled passenger arrives at a bus stop.

The Department of Transportation at IMM developed the navigation application "İBB Ceptrafik" to provide efficient and sustainable traffic management. It assists users in getting to their destination as fast as possible by utilizing routes designed with real-time traffic data from all the Marmara region, particularly Istanbul. Residents and visitors of Istanbul can more effectively plan their time in traffic jams and strategically plan their routes by taking into account both driving and public transportation options with İBB Ceptrafik (Ari, 2022).

Among issues that can make a trip to Istanbul unpleasant and damage the city's reputation are unfriendly taxi drivers who choose passengers based on destination point and higher taxi fees for tourists (Acar et al., 2019). Since smartphone applications have made it possible for car owners to communicate with others who wish to travel on the same platform, there has been an increase in demand for car sharing (Smart and Green Mobility in Istanbul, 2020). There is no trip sharing road map in Istanbul's transportation policies, and it is evident that private sector businesses handle the trip sharing activities. "OrtakAraba," "BlaBlaCar," and "Volt Lines" are a few of the current examples in Istanbul. While some of these companies, like BlaBlaCar, offer the option to share intercity trips, the majority of them have concentrated on intracity trip sharing in Istanbul (Smart and Green Mobility in Istanbul, 2020). Moreover, you can rent any nearby vehicle on the map with the brand, model, and transmission you like and start your trip easily via smartphone app Getir Drive (Getir Arac, 2022). Residents or tourists can drive according to their needs and pay as they use which also provides convenient travel experience.

Another project developed by the Istanbul Metropolitan Municipality is "IBB Taksi," a component of the smart city project that aims enhancing the taxi ride experience and lessen traffic congestion brought on by drivers cruising the streets in search of passengers (Sputnik Türkiye, 2023). IBB taxis can be easily called from BiTaksi or Uber applications. There are other payment options besides cash, like credit cards and IstanbulKart.

IstanbulKart is a must have while traveling around Istanbul. It allows for a quick and safe payment in public transportation all over Istanbul, and also provides various uses in many locations such as cafes, restaurants, grocery shopping, and parking lots (Visit Istanbul, 2023).

Another well-liked option for renting electric vehicles is available. Istanbul has a significant increase in the use of e-scooters in addition to bike sharing. For those who prefer not to be stuck in traffic, two major companies—Marti, which operates in a few specific districts of Istanbul, and Palm, which operates on university campuses—offer quick answers (Smart and Green Mobility in Istanbul, 2020). The most fun, quick, and sustainable way to get around Istanbul is with a "Marti Scooter," which you can rent through an app (Ari, 2022).

Bicycles can be used to explore the city's attractions more easily thanks to environmentally friendly bicycle-sharing programs that use GPS monitoring devices, mobile apps, and electronic card payments. These programs also help to create an environment that is more bike-friendly for urban mobility (Ari, 2022). Isbike application is a smart bike sharing system that provides a distinctive perspective of Istanbul, particularly along the Bosphorus coastline. Isbike launched in 2012 by Ispark, a subsidiary of the Istanbul Metropolitan Municipality, whose duties include parking lot management, the establishment of bike lanes and a bike-share program, all with the goal of enhancing the use of bicycles in urban transportation (Ari, 2022).

In February 2024, Istanbul Metropolitan Municipality and the Ministry of Culture and Tourism of the Republic of Türkiye launched AI-powered app to boost tourism called "Visit Istanbul" (Hurriyet Daily News, 2023) which features a web portal, an artificial intelligence tourist guide application and a platform for content creators. It will offer personalized recommendations and insights, enhancing the overall tourist experience.

In addition, there are tourist information offices in touristic centers of Istanbul that offer documentation and information about popular travel locations, activities and events; mobile apps that offer lodging, reservations for tickets and flights, reviews of restaurants; traffic information; car sharing; route planning; location-based emergency services; interactive mobile maps and travel guides; and wireless networks that guarantee continuous internet access in public areas like squares, bus stops, parks are all examples of smart tourism tools which enhance visitors' experiences, loyalty and positive word-of-mouth in Istanbul (Ari, 2022).

1.4 Smart Tourism Technologies

Technological advancements, ranging from data analysis to process automation, have significantly expedited certain procedures; nonetheless, this represents merely a portion of the tourism sector's digital transformation. Conventional one-way communication methods like exhibitions, brochures and advertising are being replaced by smart technologies like social media, smartphone applications, websites, and other ways of connecting with tourists. Several decades ago, booking a single ticket at the travel agency required hours of work and a ton of supporting paperwork. And that's not even to include the time you had to spend standing in long queues at airports, car rental desks, hotels, and other locations. Smart

technology provides more convenient conditions for travelers as they can use smartphones, laptops or other devices to communicate and share experiences with anyone, anytime and anywhere (Shen et al., 2020). Today's travelers will pick a location with fast internet connectivity and networking as well as a top-notch information infrastructure (Huang et al., 2017)

Smart tourism can also be defined as an ecosystem consisting of a smart business network, smart destinations and smart technology infrastructures that maximize the value of services and experiences for tourists (Azis et al., 2020). Smart destinations, according to Buhalis & Foerste (2015), are incorporating innovative technology into their travel offerings and use them as a platform for marketing. According to Zhang et al. (2022) and Neuhofer et al. (2015), smart tourism technologies are specialized tools, products, and services that have the potential to enhance visitors' overall experience, satisfaction, and behavioral intention while also adding value through increased personalization, connectivity, interaction, and co-creation. It is important to remember that "smart" refers to the simultaneous development and connectivity of multiple technologies rather than the advancement of a single technology (Shen et al., 2020). Several information technologies that are more appealing, effective, inclusive, and socially, economically and environmentally sustainable than their predecessors are referred to as "smart technologies" (Ari, 2022).

According to Huang et al. (2017), smart tourism technologies include a broad variety of online travel applications and information sources, including social networks, mobile apps and booking platforms, public websites, private blogs, navigation apps, personalized recommendations, virtual reality experience, company websites, and online travel agencies. In order to better serve tourists, a range of smart tourism technologies are employed. These technologies include accurate information provision, enhanced decision support, increased mobility, and high-quality tourism experiences. They also lower service costs, replace time-consuming paper records with digital communication, simplify operations, and expand the range of services available. More passengers are organizing their own journeys instead of using intermediaries like travel agencies, thanks to smart technologies and digitalization (Pai et al., 2020).

To ensure that your vacation goes as well as possible, there are many things to arrange before you leave, such as train tickets to the airport, a flight to your destination, a hotel for your stay, and a cab that will arrive in a matter of minutes. Travelers can now quickly and easily

plan their entire vacation with just a few clicks on mobile devices connecting to Wi-Fi and make mobile payments by scanning a QR code at their destination (Ari, 2022; Pai et al., 2020). They can also choose from a variety of high rated restaurant chains, attractions, and leisure activities.

Moreover, as for related to smart tourism technologies the further literature includes artificial intelligence (AI), Internet of Things (IoT), cloud computing, big data, augmented reality (AR), virtual reality (VR), near field communication (NFC), and radio-frequency identification (RFID), location-based services, geo-tag services, beacon technology, social network, mobile payment and blockchain (Ari, 2022; Pai et al., 2020; Yoo et al., 2017; Jeong, Shin, 2020). The Internet of Things will keep playing a key role in the tourism industry. Virtual Reality and Augmented Reality are new tools that have gained popularity in recent years in tourism industry allowing tourists to experience interactive, computer-assisted environment (Ari, 2022; Zhang et al., 2022a).

Artificial intelligence enables products and experiences based on big data processing to be carefully planned according to customers. Strategically placed sensors can provide real-time operational data that facilitates travel organization optimization of operations and improved customer satisfaction. This new technology provides travelers with optimal destinations that identify situational and seasonal factors in particular destinations, also known as smart destinations. For example, a travel website employing these algorithms is unlikely to suggest a resort with predicted overcrowding or bad weather (Ari, 2022).

In addition, all tourism facilities and departments are connected to smart devices such as self-service check-in machines at airports, self-service ticket machines and check-in kiosks at hotels, and guide systems at tourist spots (Ari, 2022; Pai et al., 2020). Tourists benefit from efficient and convenient services using these smart devices. Precisely, in this survey, the tourists are required to share their experience of using smart tourism technologies to provide convenience, such as in online maps and guide, payment systems, transportation systems, tour bookings, virtual tours, query systems, recommendations, and digital kiosks, by following the approach of Balakrishnan et al. (2023).

1.5 Stimulus-Organism-Response (SOR) Theory

Stimulus-organism-response (SOR) theory is a psychological framework that helps to explain how people react to various stimuli in their environment. In the context of smart tourism technologies, this theory can be used to analyze how travelers interact with and respond to different technological innovations in the tourism industry. To understand consumer decision-making, academics have used the SOR paradigm in a range of retail scenarios (Mehrabian and Russell, 1974). According to Mehrabian and Russell, 1974, environmental psychology serves as the source of the SOR theory's framework. It implies that stimuli (S) in the environment have the ability to influence and transform individuals' internal or organismic states (O). Individuals then respond to these internal states by either approach or avoidance responses (R).

The tourism industry has also made numerous applications of the SOR concept (Kim et al., 2020; San Martín, Rodríguez del Bosque, 2008; Chung et al., 2021; Wu et al., 2021; Yin et al., 2020; Xiong et al., 2023; Nieves-Pavón et al., 2023; Nieves-Pavón et al., 2023). Studies that integrate technology and tourism have already been evaluated using the SOR theory. For instance, Kim et al., (2020) highlights the significance of utilizing virtual reality before traveling to a place utilizing stimuli, while Gao et al. (2023) analyze how travel apps affect travelers' intentions and offer insights into how different stimuli affect mobile applications. SOR model has been used to assess the correlation between destination reputation, place attachment, tourist satisfaction, and search for alternative destination (Su, Swanson, 2017). Furthermore, it has been utilized by destination management organizations based on social networks, traveler emotions, and how these factors affect travelers' intentions to visit the location and co-create value (Cheung et al., 2020).

The primary goal of this research is to employ Stimulus-Organism-Response (SOR) theory to address a prevailing gap in the literature on explanation of stimuli which are four key smart tourism technologies attributes such as informativeness, accessibility, interactivity, and personalization, their impact on perceived value of smart tourism technologies experience and tourist experience satisfaction, resulting in the development of positive intentions of behavior, such as loyalty and positive word-of-mouth towards the destination. A smart tourism destination can create mobile applications that take advantage of stimuli and are more successful at satisfying the needs of visitors, raising their level of satisfaction, and boosting user engagement and loyalty by knowing how stimuli affect travelers'

perceptions and behavior (Nieves-Pavon et al., 2023). Among other things, sharing on social media and friend recommendations provide culturally appropriate experiences and information that might impact traveler behaviors. It is clear that the model is useful for assessing how tourists respond since it makes it easier to comprehend how visitors perceive and react to external stimuli and how they behave as a result (Manthiou et al., 2016).

There are two major benefits of using the SOR paradigm as the theoretical basis for this study on smart tourism destination management. On the one hand, the SOR model has already been used to study online consumer behavior, focusing on how human-technology interaction affects consumers' intentions to make purchases. On the other hand, the model's stimuli stand in for the elements that affect how well tourism applications operate (the organism), and the organism itself represents the emotional and mental conditions of users (the stimulus).

According to Zhu et al. (2022), this dynamic interaction serves as a platform for intermediate behavior that results in particular behavioral outcomes. Nieves-Pavon et al. (2023), also employed the SOR theoretical framework, which addresses physical, environmental, social, and cultural stimuli; the perceived value of the applications utilized at the destination; the level of satisfaction attained through the use of the applications; and visitor loyalty to the smart tourism destination. Xiong et al. (2023) identified the important roles of visitor engagement and memorable tourism experience with the use of the SOR model which this master's thesis is inspired by. Therefore, its utilization is appropriate for examining the behavioral intentions of tourists within the context of smart tourism technologies and the growth of smart tourism in Istanbul, Türkiye, using the Stimulus-Organism-Response (SOR) paradigm, which is based on earlier research. This study shows that little attention has been paid to how tourists' perceptions influence the use of smart tourism applications in Istanbul.

By understanding how travelers perceive and respond to smart tourism technologies, tourism industry professionals can design more effective and user-friendly tools to enhance the overall travel experience. This knowledge can also help businesses tailor their marketing strategies to better engage and attract tech-savvy travelers who value innovation and convenience in their travel experiences.

1.6 Stimulus: Smart Tourism Technologies Attributes

Previous research has examined the distinct effects of particular smart tourism technologies on the traveler's experience. Previous research classified experiences related to smart tourism technologies into four main categories, such as informativeness, accessibility, interactivity, and personalization (Huang et al., 2017; Jeong, Shin, 2020; Chung et al., 2021; No, Kim, 2015). Travelers' thoughts, perceptions, and behavioral intentions are influenced by smart tourism technologies (Ari, 2022). This master's thesis identifies the most important attributes that influence perceived value and tourist satisfaction in smart tourism destinations such as Istanbul, which are presented below.

1.5.1 Information

The attribute of information in smart tourism technologies refers to the information quality, relevance, and accuracy provided to users. This includes details about tourist attractions, accommodations, transportation options, local events, weather updates, safety tips, and more. Information is essential in this information-driven industry since tourism-related goods and services are intangible (Huang et al., 2017; Jeong, Shin, 2020; Chung et al., 2021; No, Kim, 2015). According to Huang et al. (2017), the information is a blend of up-to-date, quality, accuracy and reliability, obtained from smart tourism technologies in destinations which help users make informed decisions during their trip. Information is a key component of smart tourism technologies, as it directly influences how visitors view them. Travelers can effortlessly increase the scope and depth of pertinent tourism information by utilizing smart tourism technologies, which can serve as a source of inspiration (Shen et al., 2020). Travelers are happier and spend less time and effort searching for information when smart tourism technologies offer current, adequate, and accurate information about events, lodging, and transportation. Information aids in decision-making and encourages travelers to form logical opinions about their destinations.

1.5.2 Accessibility

Accessibility is an important attribute in smart tourism technologies as it ensures that all individuals, including those with disabilities or special needs, can fully participate in and benefit from tourism experiences. The degree of difficulty that travelers encounter attempting to access and acquire travel-related information from destinations via various forms of smart technologies is referred to as accessibility (Ari, 2022; No, Kim, 2015). Smart

tourism technologies can incorporate accessibility features such as audio descriptions, subtitles, sign language interpretation, tactile maps, wheelchair-friendly routes, and voice-activated controls to improve the journey experience in general for all visitors. Travelers find it easier when smart tourism technologies are easily accessible at their destinations, which raises the perceived ease of use of these technologies (Ari, 2022; Zhang et al., 2022). When smart tourism technologies are widely available and easy to use, tourists tend to research more during their travels, at the same time raising their degree of satisfaction and experience (Pai et al., 2020). By prioritizing accessibility in smart tourism technologies, destinations can create more inclusive and welcoming environments for a diverse range of travelers.

1.5.3 Interactivity

The interactivity attribute in smart tourism technologies refers to the level of engagement and interaction that users can have with the technology. This can include features such as personalized recommendations, interactive maps, virtual tours, real-time updates, and chatbots for instant assistance. By incorporating interactivity into smart tourism technologies, users can have a more immersive and customized experience, enhancing their overall satisfaction and enjoyment during their travels. When using smart tourism technologies, interactivity is defined as the mediator that allows for active communication between involved stakeholders and real-time traveler feedback. This has an impact on how tourists react to the technology (Pai et al., 2020). The interactivity attribute makes information discovery much easier. Travelers who engage in a lot of interaction often leave comments and reviews as a form of feedback (Zhang et al., 2022). This attribute has a major and advantageous effect on how smoothly the tourist experience goes.

1.5.4 Personalization

Personalization in smart tourism technologies refers to the ability of these technologies to tailor experiences and recommendations to individual users based on their preferences, behavior, and past interactions. Personalization pertains to the extent to which a website or application can tailor services to the specific requirements of a user of smart tourism technologies (Ari, 2022; No, Kim, 2015). This can include personalized recommendations for activities, accommodations, dining options, and more, as well as personalized communication and marketing messages. With big data or cloud computing, travelers can receive recommendations that are tailored to their preferences, personality, and past consumption patterns (Pai et al., 2020). Tailored communication combined with

personalized service can maximize tourists' satisfaction with tourism destinations and attractions, save time, satisfy their customization needs, even raise the perception of service quality (Zhang et al., 2022). Smart tourism technologies bring travelers more personalized and interesting experiences by utilizing data and artificial intelligence (Ari, 2022).

1.7 Organism: Perceived Value of Smart Tourism Technologies Experience and Tourist Experience Satisfaction

1.7.1 Perceived Value of Smart Tourism Technologies Experience

Smart tourism technologies experience perception refers to the subjective assessment of the benefits and advantages that tourists perceive when using technology in their travel experiences. In social psychology, perceptions of tourism are also regarded as major study topics. Perceived value is still important today; Consumers evaluate a product or service's overall usefulness based on their perception of what they receive and are given, according to Zeithaml (1988). It evolved from consumer behavior theory. It represents a trade-off between perceived costs and advantages.

One element enhancing the quality of the visitor experience is the use of smart tourism technologies providing creative solutions and services that cater to the needs and preferences of modern travelers (Zhang et al., 2022). Travelers' perceptions of smart tourism technologies play a crucial role in their whole travel experience and are necessary to impact their satisfaction and the destination's reputation as sustainable.

Perceived value and satisfaction have been found to be significantly correlated in recent research, and it is generally accepted that perceived value is a key predictor of behavioral intention, loyalty, and satisfaction (Jeong, Shin, 2020; Chung et al., 2021; Pai et al., 2020; Shen et al., 2020).

1.7.2 Tourist Experience Satisfaction

Kotler (1994) provided a definition of customer satisfaction as an individual's emotional response, either positive or negative, to the perceived performance or result of a product in comparison to his or her expectations. Tourist experience satisfaction is the overall evaluation of a tourist's experience during their trip to a destination. Factors that can impact tourist experience satisfaction include the quality of accommodation, food, attractions, transportation, customer service, and overall destination experience. Positive interactions

with local people, feeling safe and welcomed, and discovering unique and memorable experiences can also contribute to a tourist's overall satisfaction.

The comparison of travelers' pre-trip expectations and their actual experiences after the trip determines the level of satisfaction experienced by the tourists (Chen, Chen, 2010). When the tourists are satisfied, they may feel grateful, and when they are not, they may feel disappointed. Tourist satisfaction is hard to measure accurately because it's a subjective assessment based on the thoughts and feelings of tourists. Therefore, visitors can still be satisfied with the entire experience even if they are not especially happy with a particular service as long as they review and evaluate the entire experience favorably.

Measuring tourist experience satisfaction is important for tourism businesses and destinations to understand how well they are meeting the needs and expectations of their visitors. This information can help to identify areas for improvement and enhance the overall visitor experience, resulting in higher satisfaction and encouraging repeat visits.

There are various ways to measure tourist experience satisfaction, such as through surveys, reviews, feedback forms, and social media comments. By actively seeking and listening to feedback from tourists, businesses and destinations can make adjustments and improvements to ensure a positive and memorable experience for all visitors. Ultimately, high levels of tourist experience satisfaction can result in increased tourism revenue, positive recommendations, and a strong reputation for the destination. The primary result of a visitor experience is its memorability, which can influence visitor satisfaction (Vada et al., 2019) and destination loyalty (Jiang et al., 2015).

Constructs pertaining to tourist satisfaction have been adapted from the work of (Jeong, Shin, 2020; Chung et al., 2021; Pai et al., 2020; Shen et al., 2020). Consequently, this master's thesis examines how satisfied travelers are with the way smart tourism tools affect their travel experiences.

1.8 Response: Word-of-Mouth and Loyalty

1.8.1 Word-of-Mouth

Positive behavioral intentions are shaped by memorable experiences. Moreover, positive experiences at tourist destinations greatly influence word-of-mouth communication (Zhong

et al., 2017). According to earlier research, behavioral intention is directly impacted by satisfaction (Oliver, 1980; Anderson, Sullivan, 1993; Chen, Chen, 2010; Chen, Chen, 2010).

Word-of-mouth in tourism refers to the recommendations and reviews that travelers pass on to others based on their own experiences. It is an effective marketing tool in the travel industry as personal recommendations from friends, family, or peers are often valued more than traditional advertising. In today's tech-savvy world, word-of-mouth has expanded to include online reviews and social media recommendations. Travelers often rely on review websites, forums, and social media sites to gather information and make decisions about their trips. Tourism businesses must monitor and manage their online reputation to ensure positive word-of-mouth and attract more visitors.

Positive word-of-mouth attracts more tourists to a destination or accommodation, while negative word-of-mouth can deter potential visitors. Travelers trust the opinions of their peers and are more likely to visit a destination or book a hotel based on positive reviews from friends or family. When tourists are pleased with a tourism destination, they frequently return there or suggest the location to others (Chen, Chen, 2010; Kim, 2018). On the other hand, if visitors are not happy, they will also be quick to share their bad experiences and unlikely to recommend or return to the tourist sites (Chen, Chen, 2010; Jeong, Shin, 2020).

When evaluating the quality of any destination, travelers are generally swayed by word-of-mouth and are eager to contribute their personal experiences to the conversation (Eid et al., 2019). Overall, word-of-mouth plays a major part in forming the opinions of tourists and influencing their choice of destination. It is essential for tourism businesses to provide excellent customer experiences to encourage positive recommendations and ultimately drive more tourism to their destination.

1.8.2 Loyalty

The majority of researchers have interpreted the notion of tourism destination loyalty in accordance with the theory of customer loyalty (Amin, 2016; Jacoby, Kyner, 1973; Jugenheimer, 1979; Zeithaml et al., 1996). Behavioral loyalty, according to Zeithaml et al. (1996), has to do with a customer's behavior, such as their preference for a specific good or service and their plan to buy it again. Destination loyalty means a tourist's commitment to a destination (Lv et al., 2020; Chen, Gursoy, 2001).

Loyalty programs, incentives, and personalized experiences can help build loyalty among travelers. Loyalty in tourism can also be fostered through rewards, discounts, and exclusive perks to repeat customers. These programs incentivize travelers to choose a specific company or destination over competitors and can help build a loyal customer base. Chen et al. (2020) further mentioned revisit and recommendation intentions when defining destination loyalty. Revisit intention is the idea that a visitor intends to return to a particular location in the future (Shahijan et al., 2018).

Travelers who have greater intentions to visit a place, for instance, are likely to tell their friends, family, and other prospective travelers about it. Travelers' recommendations based on their past travel experiences have a big influence on other travelers' decision-making processes and choices (Chen et al., 2020; Chi et al., 2020). It also has an impact on travelers' intentions to travel in the future. Currently, achieving destination loyalty is more challenging than achieving general customer loyalty; therefore, exceptional marketing strategies and effort are needed.

In this study, we have examined the variable of loyalty, which is defined as a strong desire to continuously purchase or use a preferred good or service in the future, regardless of external factors like promotions and situational influences (Oliver, 1999).

Studies on the environment and commerce in shopping centers (Vilnai-Yavetz et al., 2021), social commerce websites (Molinillo et al., 2021), virtual reality in tourism (Schiopu et al., 2022), and tourist routes (Carrà et al., 2016) have already used loyalty as a response variable. Tourism managers can create strategies that enhance service quality, boost visitor satisfaction, and guarantee long-term success by realising the elements that influence visitor loyalty, such as perceived stimuli, perceived value, or satisfaction levels (Sergio Nieves-Pavon, 2023).

While loyalty has been widely used as a response variable, its use in evaluating the effects of stimuli (i.e. information, accessibility, interactivity and personalization) on the perceived value of smart tourism technologies, also its correlation with tourist experience satisfaction, and how these elements ultimately affect loyalty and word-of-mouth towards the destination in the context of SOR model are still unexplored.

It is commonly acknowledged that the perception of value plays a crucial role in the formation of adoption intentions and loyalty (Li et al., 2018). The utilization of mobile

apps has the potential to furnish real-time information and customized services based on travelers' current locations, thereby enhancing the value proposition and thereby enhancing their loyalty (Wang, 2014). It has been discovered that maintaining and growing a long-term customer base, as well as encouraging customer loyalty, depend heavily on satisfaction (Nascimento et al., 2018).

Overall, loyalty in tourism is essential for businesses to attract and retain customers, build a strong reputation, and ultimately drive success in the competitive tourism industry. By focusing on building long-term relationships, offering incentives, and providing personalized experiences, businesses can cultivate loyalty among travelers and create a loyal customer base that will keep coming back for more.

2 RESEARCH MODEL AND HYPOTHESES

2.1 Research Hypotheses

2.1.1 Smart Tourism Technologies Attributes and Perceived Value of Smart Tourism Technologies Experience

Visitors' experiences are greatly impacted by the services provided by smart tourism technologies in tourist locations and attractions (Ari, 2022; Buhalis, Amaranggana, 2015; Jeong, Shin, 2020; Shen et al., 2020). In the process of experiencing the services provided by smart tourism technologies, tourists' assessment of whether smart tourism technologies meet their expectations and requirements represents the perceived value of smart tourism technologies by tourists (Ari, 2022; Shen et al., 2020). This study examines the impact of the four smart tourism technology attributes from previous studies—information, accessibility, interactivity and personalization on the perceived value of tourists' experiences (Ari, 2022; Huang et al., 2017; Jeong, Shin, 2020; Chung et al., 2021; Pai et al., 2020; Shen et al., 2020; Shen et al., 2020).

The perceived value of smart tourism technologies lies in their ability to enhance the overall travel experience for tourists by providing personalized, convenient, engaging, and safe solutions. By leveraging these technologies, tourists can make the most of their trips and create memorable and fulfilling experiences. Businesses in the tourism industry that embrace smart tourism technologies can also benefit from increased customer satisfaction, loyalty, and competitiveness in the market. The following hypotheses are proposed in light of the arguments presented in the literature:

Hypothesis 1a (H1a): *The information provided through smart tourism technologies has a positive impact on the perceived value of smart tourism technologies experience.*

Hypothesis 1b (H1b): *The accessibility provided through smart tourism technologies has a positive impact on the perceived value of smart tourism technologies experience.*

Hypothesis 1c (H1c): *The interactivity provided through smart tourism technologies has a positive impact on perceived value of smart tourism technologies experience.*

Hypothesis 1d (H1d): *The personalization provided through smart tourism technologies has a positive impact on perceived value of smart tourism technologies experience.*

2.1.2 Smart Tourism Technologies Attributes and Tourist Experience Satisfaction

Smart tourism technology can facilitate travelers' decision-making process, improve the exploratory and exploitative uses of smart tourism, and allow travelers to share unforgettable experiences (Huang et al., 2017; Yoo et al., 2017; Jeong, Shin, 2020).

Jeon et al. (2017) find that website informativeness can significantly influence experience among tourists. Notably, previous study found that information and personalization are more important variables in creating experience and developing revisiting intention (Balakrishnan et al., 2023).

According to Huang et al. (2017), technology accessibility can affect how visitors experience smart tourism technologies since, as research suggests, accessibility eases visitors' experiences and is therefore essential to creating an enjoyable visit meaning that people need to put in less effort to process the information. Accessing smart tourism technologies could significantly influence user experience (Balakrishnan et al., 2023) as here, "smart" refers to the provision of easy accessibility for the tourists. Smart tourism technologies can variously benefit tourists, with interactivity being an important benefit. The interactivity feature in smart tourism applications is an emerging attribute (Balakrishnan et al., 2023). In addition to providing travelers with pertinent and appropriate personalized information, personalization provides significant updates regarding the implementation of smart tourism technologies (Balakrishnan et al., 2023). Personalized user notifications utilize information derived from consumers' previous actions. Buhalis, Amaranggana, (2015), Zhang et al. (2022) and Zanker et al. (2019) have posited that online personalization may have an impact on user experience.

Therefore, in the light of this aspect, the following hypotheses are proposed:

Hypothesis 2a (H2a): *The information provided through smart tourism technologies has a positive impact on the tourists' experience satisfaction.*

Hypothesis 2b (H2b): *The accessibility provided through smart tourism technologies has a positive impact on the tourists' experience satisfaction.*

Hypothesis 2c (H2c): *The interactivity provided through smart tourism technologies has a positive impact on the tourists' experience satisfaction.*

Hypothesis 2d (H2d): *The personalization provided through smart tourism technologies has a positive impact on the tourists' experience satisfaction.*

2.1.3 Perceived Value of Smart Tourism Technologies Experience and Tourist Experience Satisfaction

Travelers evaluate a destination's perceived value by weighing its costs and benefits. Perceived value and satisfaction have been shown to be significantly positively correlated in earlier research (Huang et al., 2017; Jeong, Shin, 2020; Lee et al., 2018; Pai et al., 2020; Shen et al., 2020; Zhang et al., 2022). Travelers will experience a satisfactory psychological state when their perception surpasses their expectations. Tourist satisfaction can be increased by pleasant emotional responses generated by high levels of perceived value (Balakrishnan et al., 2023). Transportation, lodging, and attractions are just a few of the components that make up "smart tourism."

For instance, the degree of engagement in smart destinations will grow if tourists can access all available information about the location and interact with the resources offered by smart tourism technologies. This, in turn, would increase the satisfaction of tourists with their travel experiences (Jeong, Shin, 2020). Consequently, a high perceived value level might elicit positive responses from visitors, boosting satisfaction. Based on the above, this study advances the following hypothesis:

***Hypothesis 3 (H3):** Perceived value of smart tourism technologies has a positive impact on tourists' experience satisfaction.*

2.1.4 Perceived Value of Smart Tourism Technologies Experience on Behavioral Intention

When individuals perceive that using smart tourism technologies enhances their overall travel experience, makes their trip more enjoyable, saves time and effort, provides relevant and personalized information, or offers unique and innovative features, they are more likely to have a positive behavioral intention towards using these technologies and they are more likely to share their experience with others through word-of-mouth. The positive perceived value of smart tourism technologies, such as mobile apps, augmented reality, and location-based services, is associated with increased behavioral intention towards using these technologies during travel. This positive intention can lead to actual behaviors such as booking a trip, exploring new destinations, engaging with local attractions, or sharing their experiences with others (Chen, Chen, 2010; Jeong, Shin, 2020).

The perceived value of smart tourism technologies on loyalty can be significant for both businesses and travelers. These technologies can provide travelers with real-time

information, personalized recommendations, and seamless booking and navigation services, ultimately leading to increased customer satisfaction and loyalty (Kim, 2018). For travelers, smart tourism technologies can offer convenience, efficiency, and personalized experiences that cater to their individual preferences and needs. By using these technologies, travelers can easily access information, plan their trips, and navigate unfamiliar destinations with ease, enhancing their overall travel experience and increasing their likelihood of returning to the same businesses or destinations in the future (Nieves-Pavón et al., 2023).

Overall, the perceived value of smart tourism technologies on loyalty and word-of-mouth lies in their ability to enhance the customer experience, provide personalized services, and create lasting connections between businesses and travelers, ultimately leading to increased customer loyalty and repeat business. Therefore, it is essential for destinations and tourism businesses to prioritize the development and implementation of user-friendly, innovative, and valuable smart technologies to enhance the overall visitor experience and generate positive word-of-mouth recommendations. Accordingly, the following hypotheses are put forward:

Hypothesis 4a (H4a): *Perceived value of smart tourism technologies has a positive impact on positive Word-of-Mouth.*

Hypothesis 4b (H4b): *Perceived value of smart tourism technologies has a positive impact on tourists' destination loyalty.*

2.1.5 Tourist Experience Satisfaction on Behavioral Intention

According to tourism studies, the level of satisfaction among visitors is a crucial factor in determining their behavioral intention. Recommendation intention, word-of-mouth, revisit intention toward the destination are referred to as behavioral intention, which is also called loyalty. Tourists' loyalty reflects the degree of the willingness to revisit the destination again (Pai et al., 2020). Most academics agree that when visitors are pleased with the tourist attractions and destinations, they are more likely to return or promote the locations to other travelers. If visitors are not happy, they are also likely to complain about the tourist spots to others and not recommend or return (Chen, Chen, 2010; Jeong, Shin, 2020). According to Lee et al. (2018), when a traveler is concurrently aware of a product, service, or travel experience at the destination, the traveler is said to be satisfied. When evaluating the quality of any destination, travelers are generally persuaded by word-of-mouth and are eager to contribute their personal experiences to the conversation (Eid et al., 2019; Jeong, Shin, 2020;

Kim, 2018). In summary, tourists' positive experiences produce intention to revisit the destination. The following theories are therefore put forth by following hypotheses:

Hypothesis 5a (H5a): *Tourists' experience satisfaction has a positive impact on word-of-mouth.*

Hypothesis 5b (H5b): *Tourists' experience satisfaction has a positive impact on tourists' destination loyalty.*

Based on the aforementioned hypotheses, we propose the research model depicted in Figure 2. Consequently, we create a research model based on the SOR theory, which describes the connections between the attributes of smart tourism technologies, perceived value of smart tourism technologies experience, tourist experience satisfaction, loyalty and word-of-mouth.

2.2 Proposed Research Model

The relationship between the four characteristics of smart tourism technologies—their perceived value, visitor satisfaction, loyalty, and word-of-mouth—was investigated by the theoretical research model that was put forth. The proposed research model, including all of the study's hypotheses, is depicted in Figure 2. Every research construct was modified and adapted from earlier research. Four attributes were identified through a literature review, which guided the selection and classification of the perceived value of smart tourism technologies experience: information, accessibility, interactivity and personalization. It was anticipated that visitor experience satisfaction, loyalty, and word-of-mouth will all be impacted by the perceived value of smart tourism technologies, accordingly, loyalty and word-of-mouth will be impacted by tourist experience satisfaction.

Referring to Figure 2, proposed research model includes smart tourism technologies attributes (information, accessibility, interactivity and personalization) as stimuli (S), perceived value of smart tourism technologies experience and tourist experience satisfaction with smart tourism technologies as the organism (O), loyalty and word-of-mouth towards the destination as the response variable (R). Notably, the study also included some control variables related to sociodemographic characteristics to assess the possible impact of gender, age, educational level, occupation, marital status etc.

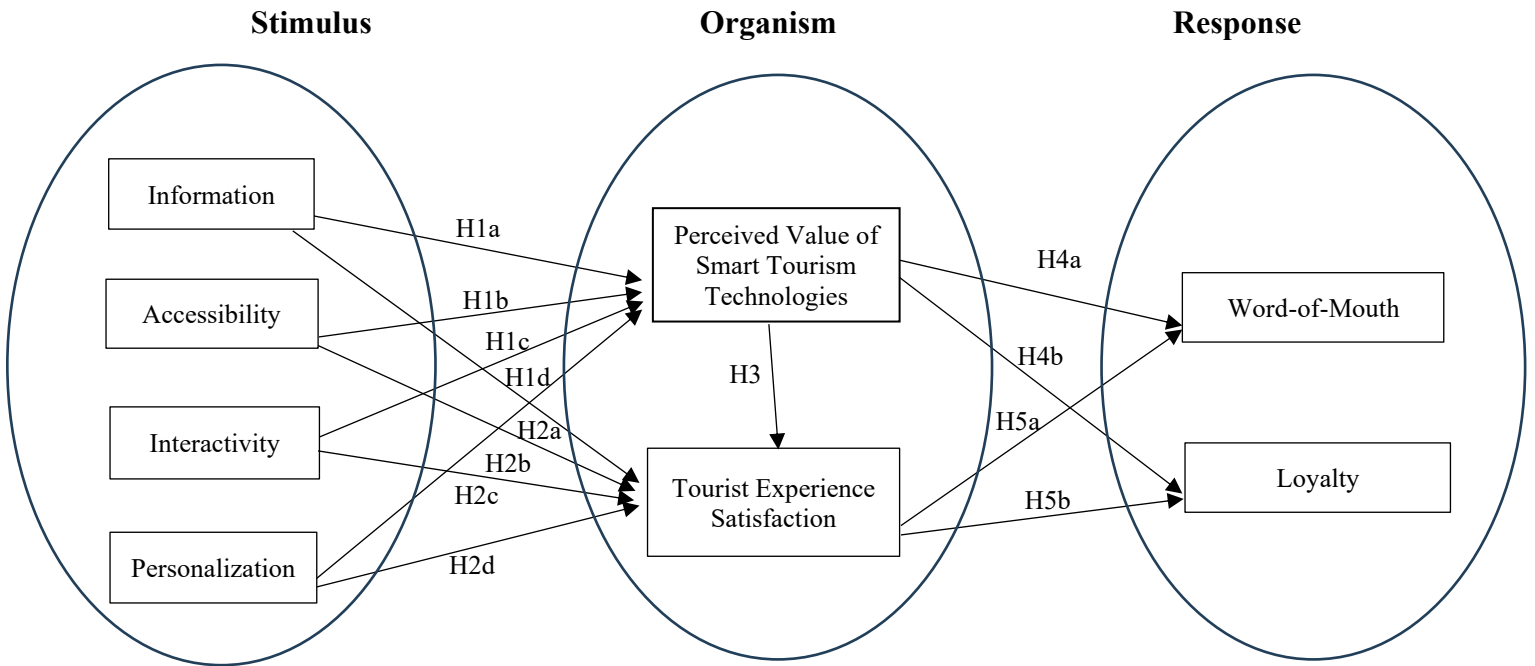


Figure 2. Proposed research model.

Source: Own development

Table 1 provides comprehensive details regarding apparent variables (subfactors) and latent variables (factors):

Table 1. Research constructs and measurement scale

Constructs	Indicators	Sources
Information	<ol style="list-style-type: none"> When traveling in Istanbul, smart tourism technologies provide me with useful destination and trip information. When traveling in Istanbul, smart tourism technologies enable me to complete my travels with reliable and detailed information. When traveling in Istanbul, smart tourism technologies help to minimize my travel concerns. 	(Ari, 2022) (Balakrishnan et al., 2023) (Jeong, Shin, 2020) (Xiong et al., 2023) (Pai et al., 2020) (Torabi et al., 2023) (Zhang et al., 2022)

Accessibility	<ol style="list-style-type: none"> 1. <i>I can use smart tourism technologies anywhere and at any time during my travels in Istanbul.</i> 2. <i>Smart tourism technologies are easily accessible during my travels in Istanbul.</i> 3. <i>Smart tourism technologies are easily found without complicated processes when traveling in Istanbul.</i> 	<p>(Ari, 2022) (Balakrishnan et al., 2023) (Jeong, Shin, 2020) (Xiong et al., 2023) (Pai et al., 2020) (Torabi et al., 2023) (Zhang et al., 2022)</p>
Interactivity	<ol style="list-style-type: none"> 1. <i>Smart tourism technologies are interactive when I travel around Istanbul.</i> 2. <i>Smart tourism technologies are highly responsive to my travels in Istanbul.</i> 3. <i>It is easy to share information and content on smart tourism technologies during my travels in Istanbul.</i> 	<p>(Ari, 2022) (Balakrishnan et al., 2023) (Jeong, Shin, 2020) (Xiong et al., 2023) (Pai et al., 2020) (Torabi et al., 2023) (Zhang et al., 2022)</p>
Personalization	<ol style="list-style-type: none"> 1. <i>I receive personalized information on smart tourism technologies when traveling in Istanbul.</i> 2. <i>Smart tourism technologies provide me with easy-to-follow links and tips while traveling in Istanbul.</i> 3. <i>Travel information provided by smart tourism technologies meet my needs when traveling in Istanbul.</i> 	<p>(Ari, 2022) (Balakrishnan et al., 2023) (Jeong, Shin, 2020) (Xiong et al., 2023) (Pai et al., 2020) (Torabi et al., 2023) (Zhang et al., 2022)</p>
Perceived Value of Smart Tourism Technologies	<ol style="list-style-type: none"> 1. <i>The services provided through Smart Tourism Technologies in Istanbul are good value for money.</i> 2. <i>The services provided by Smart Tourism Technologies in Istanbul are good for buying or renting.</i> 3. <i>The services offered by Smart Tourism Technologies in Istanbul look affordable.</i> 	<p>(Ari, 2022) (Jeong, Shin, 2020) (Nieves-Pavón et al., 2023) (Zhang et al., 2022)</p>
Tourist Experience Satisfaction	<ol style="list-style-type: none"> 1. <i>Overall, I am satisfied with the smart tourism technologies available in Istanbul.</i> 2. <i>The smart technology available in Istanbul exceeded my expectations.</i> 3. <i>I am satisfied with the quality of services provided using smart tourism technologies in Istanbul.</i> 	<p>(Ari, 2022) (Azis et al., 2020) (Balakrishnan et al., 2023) (Jeong, Shin, 2020) (Nieves-Pavon et al., 2023) (Santos-Roldán, et al., 2020) (Zhang et al., 2022)</p>

Loyalty	<ol style="list-style-type: none"> 1. <i>I enjoy visiting Istanbul as the destination using Smart Tourism Technologies.</i> 2. <i>If I had to choose a destination again, I would choose Istanbul as the destination using Smart Tourism Technologies.</i> 3. <i>I will come back soon to visit Istanbul as the destination using Smart Tourism Technologies.</i> 	<p>(Azis et al., 2020) (Nieves-Pavon et al., 2023) (Xiong et al., 2023)</p>
Word-of-Mouth	<ol style="list-style-type: none"> 1. <i>I would recommend Smart Tourism Technologies to my family, friends and peers.</i> 2. <i>I will tell my family about my positive experiences with Smart Tourism Technologies.</i> 3. <i>I will post positive reviews and comments about Smart Tourism Technologies on social media.</i> 	<p>(Torabi et al., 2023) (Zhang et al., 2022)</p>

Source: Own development

II. ANALYSIS

3 ANALYSIS

3.1 Data and Research Methodology

3.1.1 Data collection and sample

This research conducted a quantitative analysis utilizing an online questionnaire approach, in order to explore and assess possible effects that smart tourism technologies attributes could have on perceived value, visitor experience satisfaction, word-of-mouth, and loyalty. Data collection from visitors of Istanbul took place between January and March 2024. The purpose of the survey, the party in charge, and the assurance of anonymity and confidentiality of the information were all disclosed to the participants. To reduce the number of participation refusals, potential respondents were kindly encouraged to participate and only provided with survey if they agreed to take part in it. To guarantee the representativeness of the sample results, only respondents who have experience in smart tourism technologies in Istanbul participated in the questionnaire survey. In addition, participants were given information about the key definitions and attributes of smart tourism technologies. To prevent the collection of incorrect information that would otherwise affect the analysis's findings, the questionnaire was made using Google Forms. Visitors were asked to take part in the survey and a live survey link was shared through social media and online travel forums, along with a brief description of the survey's process. The questionnaire took an average of 5 minutes to complete.

Respondents were chosen by a non-random sample technique called snowball sampling, in which they invited their friends and acquaintances to take part in the survey as well. This approach satisfied several requirements, including cost-effectiveness, convenience, motivation to participate, accessibility, and availability of participants at a certain time (Etikan, 2016). As a result, it was suitable and practical for the study. A total of 154 surveys were gathered from travelers to Istanbul. Since the sample size guarantees validity and reliability, it has been determined to be sufficient.

Especially when dealing with small sample sizes as in this case, Smart PLS statistical tool and Partial Least Squares Structural Equation Modeling (PLS-SEM) is particularly popular among researchers who wish to analyze complex relationships between observed variables (measured data) and latent constructs (unobserved variables). It is used in the fields of social

sciences, marketing, and management research due to its versatility and ability to handle smaller sample sizes while delivering robust results.

3.1.2 Measurements

Our measurement model consists of a questionnaire with two sections: a section with measures of the constructs and demographic characteristics and an introduction section with instructions, a brief description of the survey to be conducted. The first part consists of 6 questions concerning socio-demographic profile (gender, age, education, occupation, marital status and category of respondents). The second section consists of 24 questions asking tourists about their perspective on smart tourism technologies attributes such as information, accessibility, interactivity, personalization, as well as perceived value of smart tourist technologies experience, tourist experience satisfaction, word-of-mouth, and loyalty in Istanbul. On a 5-point Likert scale, where 1 represented strong disagreement and 5 represented strong agreement, respondents could select their responses. The survey's purpose, guidelines for answering, and a disclaimer about protecting respondents' privacy and confidentiality were all included in the questionnaire designed in English language. Every question on the survey was created with the goal of gathering the most precise information possible to support or refute the hypotheses in the suggested model. The items and scales used in this study were gathered from the body of existing literature and tailored specifically for this research, as was the reference bibliography.

The demographic profile of the respondents, including gender, age, education level, occupation, marital status, and respondent category, is summarized in Table 2, which is included in the analysis of this study.

Table 2. Demographic characteristics of respondents (n=154)

Demographic Variables	Details	Frequency	Percentage
Gender	Female	64	41.6
	Male	90	58.4
Age	Below 20 years	16	10.4
	21-35 years	77	50
	36-45 years	41	26.6
	46-60 years	18	11.7
	Above 60 years	2	1.3
Education	Below High school	0	0
	High school	53	34.4
	Bachelor's degree	81	52.6
	Master's degree	18	11.7
	Ph.D. (Doctorate)	2	1.3
	Others	0	0
Occupation	Student	43	27.9
	Employed	73	47.4
	Self-employed	30	19.5
	Unemployed	4	2.6
	Retired	4	2.6
	Others	0	0
Marital Status	Single	47	30.5
	In a relationship	51	33.1
	Married	48	31.2
	Divorced	7	4.5
	Widow/Widower	1	0.6
Category of Respondents	Domestic tourist	53	34.4
	Foreign tourist	101	65.6
Total Respondents		154	100 %

4 EMPIRICAL RESULTS

4.1 Data Analysis

Using the computer program Smart PLS 4.1.0.0, empirical partial least square structural equation modelling (PLS-SEM) findings were achieved. Smart PLS and PLS-SEM analysis are valuable tools for researchers looking to understand and model complex relationships in their data, especially in scenarios with less stringent requirements regarding sample size and variable distribution. It can estimate intricate models with many constructs and indicator variables and has good prediction ability. As a result, the approach selected for this investigation was determined based on the hypothesized nature of the relationships proposed. Two steps make up the PLS-SEM analysis: the measurement model's validation and the structural model evaluation. Links between latent variables and observable data are represented by measurement models, and links between latent variables are represented by structural models. The questionnaire was deemed to be highly accurate as an outcome. Furthermore, once the preliminary test was distributed, some of the questions' wording was altered to remove any potential for misunderstanding before the final questionnaire was formally published. Descriptive analysis of the demographic data (see Table 2) revealed that the majority of respondents (77 or 50%) were between the ages of 21 and 35, and the majority of the sample (64 or 41.6%) was made up of females. The majority of visitors are employed (73 or 47,4%) and have a bachelor's degree (81 or 52,6%). The majority of respondents to this survey (101, or 65.6%) were foreign visitors, followed by local visitors (53, or 34.4%). The analyses and findings are covered in the section that follows.

4.2 Multicollinearity

Multicollinearity in a multiple regression model indicates a high level of linear intercorrelation between independent variables and may lead to erroneous regression analysis conclusions (Kim, 2019). It may become challenging to understand the distinct effects of each variable on the dependent variable as a result of inflated standard errors and unstable coefficients in the regression model. Multicollinearity can also make it challenging to identify important variables in the model and affect the overall fit and predictive power of regression model. As a diagnostic tool, variance inflation factor (VIF) for each element was used to evaluate the viability of multicollinearity. According to Hair et al. (2017), VIF of less than five frequently indicates multicollinearity is no longer an issue for the model.

VIF of five or ten suggests that there might be issues with multicollinearity. It's important to address multicollinearity to ensure the reliability of the regression analysis findings. It is suggested that VIF of more than 3.3 indicates both pathological collinearity and the possibility of common method bias contamination in a model. Thus, the model can be deemed free of common method bias if all VIFs obtained from the whole collinearity test are equal to or less than 3.3 (Kock, 2015; Hair et al., 2017). Overall, it is important to carefully assess and address multicollinearity in a multiple regression model to ensure the reliability and validity of the model results.

Table 3. Variance Inflation Factor (VIF)

Items/Indicators	Variance Inflation Factor (VIF)
ACC1	1.595
ACC2	1.764
ACC3	1.847
INF1	1.533
INF2	1.742
INF3	1.604
INT1	1.879
INT2	1.721
INT3	1.480
LOY1	2.309
LOY2	2.008
LOY3	2.627
PER1	1.664
PER2	1.678
PER3	1.630
PV1	3.166
PV2	2.652
PV3	2.436
SAT1	1.822
SAT2	1.840
SAT3	1.689
WOM1	2.353
WOM2	1.881
WOM3	2.193

Note: ACC = Accessibility, INF = Information, INT = Interactivity, LOY = Loyalty, PER = Personalization, PV = Perceived Value of Smart Tourism Technologies Experience, SAT = Tourist Experience Satisfaction, WOM = Word-of-Mouth

Source: Authors' Estimations from Smart PLS 4.1.0.0

4.3 Measurement Model: Internal Consistency and Reliability

The degree to which every item on a test or questionnaire measures the same underlying construct or concept is known as internal consistency reliability. In other words, it assesses the degree to which all items within a scale or measure are consistent with each other. Higher reliability is associated with a smaller standard error of measurement, and reliability testing is intended to confirm the consistency, stability, and reliability of scale data. Composite reliability (also known as construct reliability) occasionally, is a measure of internal consistency reliability that is comparable to Cronbach's alpha. According to Hair et al. (2017), researchers used Cronbach's alpha coefficients and the Dijkstra-Henseler rho to assess the model for internal consistency and reliability features. It is advised that the composite reliability and Cronbach's alpha values in exploratory research be greater than 0.70 (Hair et al., 2017). Table 4 illustrates that all Cronbach's α values were higher than 0.7, signifying strong reliability for every item. The analysis also satisfied the criteria for composite reliability, which were determined by using threshold values of 0.9 and 0.7 for the Dijkstra-Henseler and Joreskog rho metrics, respectively. Our findings demonstrate that every construct taken into account has a composite reliability value that is appropriate.

Accessibility (0.882), Information (0.871), Interactivity (0.873), Loyalty (0.917), Perceived Value of Smart Tourism Technologies Experience (0.877), Personalization (0.933), Tourist Experience Satisfaction (0.888) and Word-of-Mouth (0.910). Consequently, a greater level of internal consistency is seen in every item signifying that the model is reliable.

Table 4. Construct Reliability and Validity

Latent Constructs	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
ACC	0.800	0.805	0.882	0.715
INF	0.778	0.788	0.871	0.693
INT	0.784	0.810	0.873	0.696
LOY	0.865	0.870	0.917	0.788
PER	0.789	0.790	0.877	0.703
PV	0.893	0.907	0.933	0.823
SAT	0.811	0.812	0.888	0.726
WOM	0.852	0.859	0.910	0.770

Note: ACC = Accessibility, INF = Information, INT = Interactivity, LOY = Loyalty, PER = Personalization, PV = Perceived Value of Smart Tourism Technologies Experience, SAT = Tourist Experience Satisfaction, WOM = Word-of-Mouth

Source: Authors' Estimations from Smart PLS 4.1.0.0

4.4 Factors Loadings

Factor loadings refer to the correlation between the observed variables in a factor analysis and the latent factor they are trying to measure. The direction and strength of the relationship between each observed variable and the underlying factor are indicated by the factor loading value. Higher factor loading values (closer to 1) indicate a stronger relationship between the observed variable and the factor, suggesting that the variable is a better indicator of the factor. Conversely, lower factor loading values (closer to 0) suggest a weaker relationship between the observed variable and the factor. Regarding the latent construct factor loadings, every item had a loading that was considerably higher than the threshold point. A factor loading of 0.7 or higher in the SEM technique usually indicates that the factor extracts sufficient variance from the measured value (Hair et al., 2009).

Factors loadings are important because they help researchers understand which variables are most closely associated with the latent factor being measured, allowing for a more accurate interpretation of the results of the factor analysis.

Table 5. Factor Loadings

	ACC	INF	INT	LOY	PER	PV	SAT	WOM
ACC1	0.816							
ACC2	0.846							
ACC3	0.873							
INF1		0.792						
INF2		0.867						
INF3		0.835						
INT1			0.834					
INT2			0.870					
INT3			0.797					
LOY1				0.896				
LOY2				0.858				
LOY3				0.908				
PER1					0.837			
PER2					0.838			

PER3					0.841			
PV1						0.927		
PV2						0.887		
PV3						0.908		
SAT1							0.850	
SAT2							0.862	
SAT3							0.843	
WOM1								0.881
WOM2								0.874
WOM3								0.879

Note: ACC = Accessibility, INF = Information, INT = Interactivity, LOY = Loyalty, PER = Personalization, PV = Perceived Value of Smart Tourism Technologies Experience, SAT = Tourist Experience Satisfaction, WOM = Word-of-Mouth

Source: Authors' Estimations from Smart PLS 4.1.0.0

4.5 Cross Loadings

Cross loadings in factor analysis refer to the correlation between an observed variable (indicator) and a factor other than the one it is intended to measure. This can indicate that the observed variable is influenced by multiple factors, rather than just the one it is supposed to represent. Cross loadings are important to consider in factor analysis because they can complicate the interpretation of the results. High cross loadings suggest that an observed variable may not be a good indicator of the intended factor and may need to be excluded from the analysis or interpreted with caution. Researchers should carefully examine cross loadings when conducting factor analysis to ensure that the observed variables are accurately measuring the underlying factors of interest.

Table 6. Cross Loadings

	ACC	INF	INT	LOY	PER	PV	SAT	WOM
ACC1	0.816	0.506	0.573	0.492	0.391	0.343	0.524	0.234
ACC2	0.846	0.566	0.593	0.629	0.518	0.379	0.524	0.356
ACC3	0.873	0.533	0.607	0.516	0.516	0.462	0.552	0.342
INF1	0.555	0.792	0.419	0.444	0.281	0.313	0.390	0.366
INF2	0.482	0.867	0.413	0.403	0.350	0.400	0.480	0.374
INF3	0.553	0.835	0.442	0.476	0.363	0.368	0.456	0.339
INT1	0.540	0.338	0.834	0.496	0.510	0.306	0.404	0.163
INT2	0.649	0.514	0.870	0.530	0.588	0.524	0.557	0.249
INT3	0.543	0.388	0.797	0.557	0.578	0.472	0.411	0.301
LOY1	0.556	0.526	0.562	0.896	0.602	0.554	0.653	0.427

LOY2	0.592	0.484	0.593	0.858	0.608	0.432	0.575	0.358
LOY3	0.571	0.390	0.535	0.908	0.545	0.434	0.621	0.335
PER1	0.449	0.273	0.504	0.520	0.837	0.633	0.528	0.430
PER2	0.461	0.321	0.669	0.567	0.838	0.577	0.572	0.489
PER3	0.508	0.409	0.525	0.569	0.841	0.539	0.675	0.509
PV1	0.475	0.381	0.561	0.522	0.703	0.927	0.569	0.412
PV2	0.320	0.323	0.381	0.357	0.561	0.887	0.528	0.352
PV3	0.463	0.465	0.500	0.555	0.617	0.908	0.712	0.459
SAT1	0.485	0.446	0.423	0.522	0.562	0.594	0.850	0.483
SAT2	0.550	0.474	0.482	0.621	0.618	0.519	0.862	0.476
SAT3	0.574	0.444	0.522	0.632	0.625	0.607	0.843	0.393
WOM1	0.268	0.330	0.242	0.276	0.498	0.395	0.390	0.881
WOM2	0.302	0.363	0.308	0.428	0.529	0.484	0.490	0.874
WOM3	0.399	0.439	0.207	0.391	0.466	0.308	0.499	0.879

Note: ACC = Accessibility, INF = Information, INT = Interactivity, LOY = Loyalty, PER = Personalization, PV = Perceived Value of Smart Tourism Technologies Experience, SAT = Tourist Experience Satisfaction, WOM = Word-of-Mouth

Source: Authors' Estimations from Smart PLS 4.1.0.0

4.6 Convergent validity

In order to demonstrate the validity of the survey data, validity analysis for discriminant validity and convergent validity were carried out. Convergent validity is the degree to which the new scale correlates with other variables and other measures of the same construct. The construct must not only not correlate with unrelated, different variables, but also with related ones. In other words, it evaluates whether a measure is measuring what it is intended to measure by examining its correlation with other measures that are theoretically related to the same construct. Strong convergent validity indicates that the measure is accurately capturing the intended construct. Convergent validity can be evaluated using the average variance extracted (AVE) and the factor loading of each indicator (Hair et al., 2017). Convergent validity is statistically demonstrated when the factor indicator loading is more than 0.708 because the square of that number (0.7082) equals 0.50, indicating that 50% of the AVE is achieved. Lower loading indicators, however, can only be taken into account in conjunction with other indicators that have an AVE of 0.50 or higher.

According to the findings, all of these constructs' indicators displayed higher loadings (i.e., above 0.70 and AVE above 0.50). AVE results for Accessibility (0.715), Information

(0.693), Interactivity (0.696), Loyalty (0.788), Perceived Value (0.703), Personalization (0.823), Tourist Experience Satisfaction (0.726) and WOM (0.770) are displayed in Table 4 confirmed the convergent validity of the measurement model. In conclusion, the data gathered is satisfactory and all of the indicators make sense.

4.7 Discriminant Validity

4.7.1 Fornell-Larcker Criterion

The Fornell-Larcker test, which suggests that a construct is distinctive empirically and representing a noteworthy phenomenon that other measures in the model fail to capture, was also used to investigate discriminant validity (Henseler et al., 2015). Based on the findings of the Fornell-Larcker test, discriminant validity is established and both the basic and strict assumptions are satisfied. It is important to remember that each construct measured in Table 4 must have an AVE value more than 0.5. Overall, Fornell-Larcker criterion is a useful tool to evaluate the validity of the measures and ensure that they are accurately capturing distinct constructs in the study.

Table 7. Discriminant Validity – Fornell-Larcker Criterion

	ACC	INF	INT	LOY	PER	PV	SAT	WOM
ACC	0.845							
INF	0.632	0.832						
INT	0.699	0.509	0.834					
LOY	0.644	0.527	0.634	0.887				
PER	0.564	0.400	0.674	0.659	0.839			
PV	0.470	0.436	0.537	0.537	0.694	0.907		
SAT	0.631	0.534	0.560	0.696	0.707	0.672	0.852	
WOM	0.369	0.431	0.291	0.422	0.568	0.454	0.528	0.878

Note: ACC = Accessibility, INF = Information, INT = Interactivity, LOY = Loyalty, PER = Personalization, PV = Perceived Value of Smart Tourism Technologies Experience, SAT = Tourist Experience Satisfaction, WOM = Word-of-Mouth

Source: Authors' Estimations from Smart PLS 4.1.0.0

4.7.2 Heterotrait-Monotrait ratio

The Heterotrait-Monotrait ratio (HTMT) is a statistical measure used to assess the convergent and discriminant validity of a measurement instrument. It is calculated by dividing the average correlation between different traits (heterotrait correlations) by the

average correlation of the same trait measured at different time points or in different ways (monotrait correlations). Researchers generally consider a HTMT value below 0.90 to be an acceptable degree of discriminant validity. The Heterotrait-Monotrait ratio (HTMT) result in Table 8 was suitable for this investigation because it was less than the minimum requirement of 0.85-0.90. This means that if the HTMT value for a particular construct is greater than 0.90, it indicates that there is a high level of heterotrait-monotrait correlation and suggests that the construct may not be distinct enough from other constructs in the model.

Table 8. Discriminant Validity – Heterotrait-Monotrait Ratio (HTMT)

Constructs	ACC	INF	INT	LOY	PER	PV	SAT	WOM
ACC								
INF	0.807							
INT	0.872	0.634						
LOY	0.777	0.644	0.768					
PER	0.707	0.506	0.850	0.798				
PV	0.543	0.511	0.612	0.596	0.824			
SAT	0.781	0.668	0.684	0.827	0.880	0.781		
WOM	0.443	0.529	0.344	0.482	0.690	0.511	0.630	

Note: ACC = Accessibility, INF = Information, INT = Interactivity, LOY = Loyalty, PER = Personalization, PV = Perceived Value of Smart Tourism Technologies Experience, SAT = Tourist Experience Satisfaction, WOM = Word-of-Mouth

Sources: Authors' Estimations from Smart PLS 4.1.0.0

4.8 Structural Model and Hypotheses Testing

We have developed our structural model and hypothesis testing based on our theoretical framework and research hypotheses; the results are presented in this section. Smart PLS 4.1.0.0 was used to assess and estimate the structural model. The path analysis of the structural model can be used to further improve the model's fit quality. The identification and establishment of construct relationships, or causal relationships supporting research assumptions and hypotheses is made possible by this methodology.

4.8.1 Hypothesis Testing

The findings shed light on how satisfied travelers were with their trip and how Istanbul is perceived as a smart tourism technology providing smart tourism destination. To estimate

the parameter's statistical significance, a bootstrapping method with a 5,000-sample size and one-tailed significance was applied. There are eight variables involved in this study. Relationships that significantly impact and support the pertinent hypothesis are marked as "Supported" in the "Decision" column of the table below.

H1d and H1a hypothesis are supported according to Table 9. The results of the direct relationship showed that personalization has the highest value (H1a, $\beta = 0.594$, $t = 6.729$, $p = 0$), followed by information (H1d, $\beta = 0.182$, $t = 2.704$, $p = 0.003$) which were positively related with perceived value of smart tourism technologies. The results showed that personalization (H2d, $\beta = 0.373$, $t = 4.348$, $p = 0$), accessibility (H2b, $\beta = 0.271$, $t = 2.868$, $p = 0.002$), information (H2a, $\beta = 0.145$, $t = 2.026$, $p = 0.021$) were positively related with tourist experience satisfaction. The perceived value of smart tourism technologies was positively related with tourist experience satisfaction (H3, $\beta = 0.278$, $t = 4.238$, $p = 0$) and word-of-mouth (H4a, $\beta = 0.182$, $t = 1.815$, $p = 0.035$). Tourist experience satisfaction was positively related with loyalty (H5b, $\beta = 0.612$, $t = 6.853$, $p = 0$) and word-of-mouth (H5a, $\beta = 0.406$, $t = 3.685$, $p = 0$).

Moreover, the results indicated that accessibility (H1b, $\beta = -0.022$, $t = 0.201$, $p = 0.420$) and interactivity (H1c, $\beta = 0.059$, $t = 0.599$, $p = 0.275$) were negatively related to perceived value of smart tourism technologies. Consequently, H1b and H1c hypotheses are not supported in this study. Interactivity (H2c, $\beta = -0.104$, $t = 1.253$, $p = 0.105$) was negatively related to tourist experience satisfaction showing that H2c hypothesis is not supported as well. Also perceived value of smart tourism technologies (H4b, $\beta = 0.125$, $t = 1.415$, $p = 0.079$) was negatively related to loyalty.

Table 9. Hypothesis testing

Hypotheses	Original Sample (O)	Sample Mean (M)	Standard Deviation (SD)	T-Statistics	P-Values	Decision
H1b: ACC -> PV	-0.022	-0.021	0.109	0.201	0.420	Not supported
H2b: ACC -> SAT	0.271	0.269	0.094	2.868	0.002	Supported
H1a: INF -> PV	0.182	0.187	0.067	2.704	0.003	Supported
H2a: INF -> SAT	0.145	0.145	0.072	2.026	0.021	Supported
H1c: INT -> PV	0.059	0.059	0.098	0.599	0.275	Not supported
H2c: INT -> SAT	-0.104	-0.104	0.083	1.253	0.105	Not supported
H1d: PER -> PV	0.594	0.589	0.088	6.729	0.000	Supported
H2d: PER -> SAT	0.373	0.373	0.086	4.348	0.000	Supported

H4b: PV -> LOY	0.125	0.128	0.089	1.415	0.079	Not supported
H3: PV -> SAT	0.278	0.280	0.066	4.238	0.000	Supported
H4a: PV -> WOM	0.182	0.182	0.100	1.815	0.035	Supported
H5b: SAT -> LOY	0.612	0.610	0.089	6.853	0.000	Supported
H5a: SAT -> WOM	0.406	0.407	0.110	3.685	0.000	Supported

Note: ACC = Accessibility, INF = Information, INT = Interactivity, LOY = Loyalty, PER = Personalization, PV = Perceived Value of Smart Tourism Technologies Experience, SAT = Tourist Experience Satisfaction, WOM = Word-of-Mouth

Sources: Authors' Estimations from Smart PLS 4.1.0.0

4.8.2 Coefficient of determination

Furthermore, by calculating the coefficient of determination, the predictive value of the constructs was examined. The coefficient of determination (R^2) value shows the percentage of change in the dependent variable that was explained by the independent variable. The perceived value of smart technologies and visitor satisfaction account for 49% of the variance in the loyalty R^2 value of 0.494.

Therefore, 51% of the variance is attributable to independent constructs (accessibility, information, interactivity and personalization), according to the R^2 of perceived value (0.513). Table 10 presents that R^2 of tourist experience satisfaction is 0.641, indicating that approximately 64% of the variance is due to the perceived value of smart tourism technologies and smart tourism technologies attributes (accessibility, information, interactivity and personalization). R^2 of WOM (0.297) shows that around 30% of the variance is explained by perceived value of smart technologies and tourist satisfaction. The R^2 values in Table 10 indicate that the model fits the data satisfactorily, which explains the results.

Table 10. Coefficient of determination

	R-square (R^2)	R-square adjusted
LOY	0.494	0.487
PV	0.513	0.500
SAT	0.641	0.629
WOM	0.297	0.288

Note: LOY = Loyalty, PV = Perceived Value of Smart Tourism Technologies, SAT = Tourist Experience Satisfaction, WOM = Word-of-Mouth

Sources: Authors' Estimations from Smart PLS 4.1.0.0

4.8.3 Structural model

The hypothesized causal correlations were tested, and the evaluation results were presented in Figure 3.

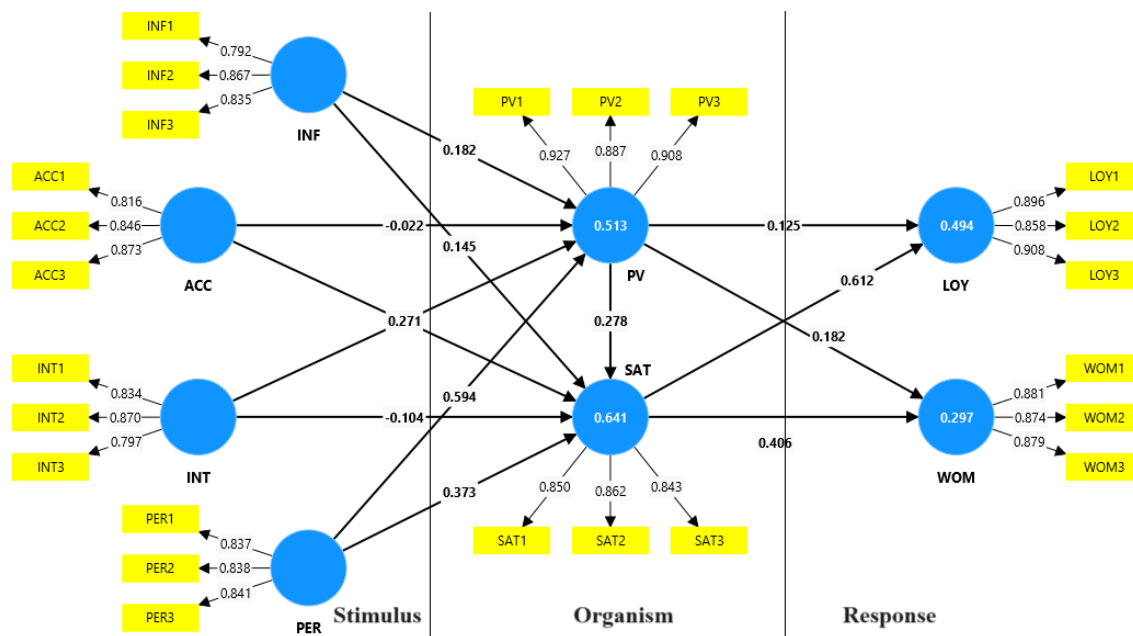


Figure 3. Structural Equation Model extracted from Smart PLS 4.1.0.0 and SOR framework

Sources: Authors' Estimations from Smart PLS 4.1.0.0

Based on the above interpretation, it can be concluded that the model in this study is fit, the number is close to the characteristics of compliance by some criteria, so it is advisable to use the model in this study.

5 DISCUSSIONS

This master's thesis aims to investigate how smart tourism technologies attributes (stimulus) enhance tourists' loyalty and positive word-of-mouth (response) about the destination through perceived value of smart tourism technologies and tourist experience satisfaction (organism).

We found that the hypothesis of H1a, H1d, H2a, H2b, H2d, H3, H4a, H5a and H5b were supported. However, H1b, H1c, H2c and H4b were rejected. This research model has empirical significance, and the results enhance critical perspectives and advance the development of theories in the field of smart tourism research.

H1a and H1d indicate that smart tourism technologies attributes of information and personalization are positively related to perceived values of smart tourism technologies. It means that tourists perceive a high level of value of these two attributes of smart tourism technologies. H2a, H2b and H2d indicate that smart tourism technologies attributes of information, accessibility and personalization are positively related to tourist experience satisfaction, meaning that these three attributes lead to experience satisfaction in the destination. H3 indicates that perceived value of smart tourism technologies experience is positively related to tourist experience satisfaction. This means that smart tourism technologies can enhance tourists' experience satisfaction in tourism destination of Istanbul. H4a indicates that perceived value of smart tourism technologies experience is positively related to the word-of-mouth. So, the likelihood that tourists will spread positive word-of-mouth about tourism destination of Istanbul along with smart tourism technologies experience increases when they have positive smart tourism technology perception experiences there. H5a and H5b indicate that tourist experience satisfaction is positively related to loyalty and word-of-mouth. The results show that the more satisfied experiences they will have about the destinations and smart tourism technologies the more positive behavioral intentions they will have.

H1b and H1c indicate that accessibility and interactivity are negatively related to the perceived value of smart tourism technologies experience proving that accessibility and interactivity attributes of smart tourism technologies are weak as for tourists' perceptions. H2c indicates that interactivity is negatively related to tourist experience satisfaction. This could be clarified by the reality that tourists use smart technologies regularly on daily basis,

so smart tourism technologies in tourism destinations are not new to them and cannot be further excited by them.

H4b indicates that perceived values of smart tourism technologies experience is negatively related to loyalty. This can be explained by the fact that when a place offers tourists truly remarkable travel experiences, they will be more inclined to return.

5.1 Theoretical Contributions

This master's thesis has several theoretical contributions based on the findings. This study presented the first attempt to integrate smart tourism technologies, perceived value of smart tourism technology, tourist experience satisfaction, loyalty, and word-of-mouth into a theoretical framework and empirically analyze it.

According to the SOR theory, we designed a theoretical model including smart tourism technologies, perceived value from smart tourism technologies, tourist experience satisfaction, loyalty and word-of-mouth. It also verified the aforementioned hypotheses in the context of smart tourism in Istanbul. Therefore, another addition of this master's thesis is the examination of the abovementioned relationships in the setting of Istanbul, Türkiye. Being a world-known travel location, employing smart tourism technologies created the perfect setting for conducting this kind of survey.

Hence, this master's thesis indicates that in order to give tourists a better experience and perceived value that encourages loyalty and word-of-mouth, developing technologies need to be introduced and accepted in the tourism industry. If a place offers visitors satisfaction and memorable travel experiences, they will be more likely to return.

The outcomes of this study aid into understanding of the advantages of smart tourism technologies on perceived value of smart tourism technologies and tourist experience satisfaction leading to positive behavioral intention and lay the groundwork for upcoming studies.

5.2 Practical Implications

Precisely, smart tourism technologies can create convenience and enjoyable travel experiences such as location-based queries, restaurant reviews, and mobile wallet payments so, government and destination management organizations can get practical insight for creating specific activities to enrich tourist experiences based on the development of the smart tourism technologies. The case of smart technologies related to tourism was chosen as the researcher had easier and more immediate access. Thanks to respondent's opinion, the researcher can provide an answer to the overall goal of this study, which is to explore how smart tourism through online booking systems, mobile apps, mobile payment, the use of social networks and online reviews has changed this sector and lead to tourist loyalty and positive word-of-mouth. The results of the study can help tourism destination managers better understand the impact of smart technology on traveler personalities and create more effective tourist attraction strategies.

First, smart tourism technologies have become essential components of tourism attractions that greatly affect perceived value with smart tourism technologies, tourist experience satisfaction, and finally, influence loyalty to the destination and word-of-mouth. Destination managers can evaluate the current performance and issues with smart tourism technologies from the perspectives of its adopters to increase tourists' chances of returning. Travelers' involvement and experience will be improved when they consider smart tourism technologies to be highly accessible, informative, interactive, and personable.

For instance, tourism destination managers can provide a platform where travelers can exchange trip information, increasing visitors' perception of how useful smart tourism technologies are and giving them more engaging travel experiences. To improve the interaction of smart tourist technology, managers should try to invest more in augmented reality and virtual reality applications, such as VR glasses and AR self-guided systems. It is imperative for destination managers to consider augmented reality tools when studying technological changes in the tourist industry, as they enable clients to see attractions prior to departing. Therefore, it is essential that destination management operations, technology application developers, and tourism managers work to encourage and educate travelers to use contemporary technologies in the tourism industry. The poor rate of technology adoption in tourism-related organizations may be attributed, in part, to a lack of compelling content. Other solutions that claim to improve customer happiness and reduce customer service

expenses are chatbots and virtual assistants. While they might not be smart enough to replace people today, they most likely won't replace live travel agent interactions, most communications connected to basic travel information or vacation planning can eventually be automated.

Smart tourism technologies reduced travel expenses, especially airline tickets, and consequently the costs of hotels, travel agencies, and tour operators. Additionally, it eliminated the need for tourists to use travel agencies in order to organize their travels and get information online. The most recent technological advancements are solving problems related to mass tourism and enabling personalized experiences and sustainability. Because of this, its implementation and use are changing the tourism sector and improving the situation for both businesses and customers.

By leveraging smart technologies such as mobile devices, location-based services, personalized recommendations, and virtual assistants, tourism industry businesses can enhance the overall travel experience for their customers.

5.3 Limitations and Recommendations for Future Research

This master thesis has a few limitations. Firstly, this research aimed at tourists who visited Istanbul, Türkiye and experienced its tourism culture and environment. The findings of this thesis cannot be generalized straightforwardly to other cities and countries. To emphasize the generalizability of the findings reported in this study, data from other tourist destinations with distinct characteristics should be gathered for future research. Moreover, future studies should keep looking at additional facets of the tourism experience.

Secondly, no additional research or comparison of various demographic factors has been done. Also due to time limitations, the sample size of the respondents is small, and the majority of our sample are young adults. Respondents with varying jobs, genders, ages, and geographic locations, as well as varying degrees of experience with smart technology, may have differing opinions about using these technologies. Further studies may examine the demographic attributes of the participants and draw comparisons between them in a horizontal and vertical way to gain a deeper comprehension of any variations across distinct tourist categories utilizing smart tourism technologies.

Thirdly, the loyalty and word-of-mouth of travelers were only examined using cross-sectional data in this study, which is limited in understanding tourists' actual behavioral intentions. Therefore, longitudinal research is required to present more evidence and learn more about the behavioral intentions of tourists.

Fourth, despite its good fit with the present studies, the SOR theory has several limitations. When it comes to choosing variables and generating theoretical predictions, the SOR framework is too broad and lacks precision and complexity. It is suggested that future studies make use of the Theory of Reasoned Action (TRA) to investigate the ways in which visitors' psychological experiences and attitudes influence their intention to revisit in relation to the employment of smart tourism technologies. This would shed light on sustainable tourism destination development and tourism related advanced technology.

6 CONCLUSIONS

Businesses in tourism industry are becoming more conscious of how digital technology may enhance internal processes and help them adapt to changing consumer demands. Hence, this master's thesis aims to investigate the mechanisms by which smart tourism technologies influence travelers' loyalty and word-of-mouth. This research highlights how stimuli as smart tourism technologies attributes, influence the organism that is composed of the perceived value of smart tourism technologies and satisfaction with it, ultimately resulting in a response represented by loyalty.

By identifying the factors that influence perceived value, tourist experience satisfaction and behavioral intention, businesses and destination managers can design and implement effective technology solutions that meet the needs and expectations of travelers, enhance their overall experience, and drive positive outcomes in the tourism industry. Smart applications for destinations are being released to improve both the quality of life for locals and visitors. The complete transformation of the smart city requires the integration of ICT and IoT systems. Since airports are the first locations that might have an impact on a visitor's experience, they play a particularly significant role in changing the tourist experience.

By focusing on delivering value through technology-enabled experiences, businesses can attract and retain customers, differentiate themselves in the market, and create memorable and engaging travel experiences for their guests. Destination management organizations must combine important destination components with smart city features to boost visitor satisfaction and the destination's competitiveness. This entails creating smart technology at a travel destination.

Furthermore, the implementation of smart tourism apps across all governmental domains would take Istanbul to the world stage and establish its leading position in the competitive global market. Tourism agencies need to have lean, cost-effective business strategies to handle these issues and the rapid pace of technology change. In the modern world, there is competition among destinations rather than among countries or even cities. Using technology to fortify the destinations with creative and sustainable business concepts is the competition's biggest motivator. Consequently, smart tourism destinations are essential to the tourism industry since they give cities special chances to become the top destinations for both domestic and international travelers.

Smart tourist destinations can create mobile applications that are better at satisfying visitor demands, raising satisfaction levels, and boosting user engagement and loyalty by understanding how stimuli affect travellers' perceptions and behaviour. The range and diversity of tourism-related goods, services, and experiences have expanded with the emergence of digital platforms, and on-demand features have accelerated business transactions, consumer awareness, and feedback. Reduced waste, reduced energy and water consumption, improved transportation quality through open tourism data, sustainable green spaces, etc. are all advantages of more efficient and effective destinations.

Overall, research of impact of smart tourism technologies on the perceived value of smart tourism technologies experience and tourist satisfaction on behavioral intention highlights the importance of understanding how travelers perceive and interact with technology during their travel experiences. These findings offer several insights for future research on the modern tourist environment, as well as significant management implications.

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
AR	Augmented Reality
AVE	Average Variance Extracted
BRT	Bus Rapid Transit
DMO	Destination Management Organization
EBRD	European Bank for Reconstruction and Development Green Cities
FCDO	Foreign Commonwealth and Development Office
FEE	Foundation for Environmental Education
GCAP	Green City Action Plan
GDP	Gross Domestic Product
HTMT	Heterotrait-Monotrait Ratio
IBB	İstanbul Büyükşehir Belediyesi (Istanbul Metropolitan Municipality)
ICT	Information and Communication Technology
IETT	Istanbul Electricity and Tramway and Tunnel General Directorate
IMM	Istanbul Metropolitan Municipality
IoT	Internet of Things
ISBAK	Istanbul Smart City Technologies Inc.
NFC	Near Field Communication
OECD	Organization for Economic Co-operation and Development
PLS SEM	Partial Least Square Structural Equation Modeling
RFID	Radio-Frequency Identification
SDG	Sustainable Development Goals
SOR	Stimulus Organism Response Theory
SUMP	Sustainable Urban Mobility Plan
TRA	Theory of Reasoned Action

VIF	Variance Inflation Factor
VR	Virtual Reality
WOM	Word-of-Mouth
WTTC	World Travel and Tourism Council

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APPENDICES

APPENDIX I: QUESTIONNAIRE CONTENT

These are details of the used questionnaire, along with how its questions relate to the variables that have been used in the study. The respondents were notified that no information about their legal companies or personally identifiable information was shared. A full list of the questions that comprise the questionnaire is provided below:

The Role of Smart Tourism Technologies towards Destinations' Loyalty and Positive Word-of-Mouth: A Perspective through SOR Theory

My name is Meryem Czyž and I am a master's student of Business Administration at Tomas Bata University in Zlín, Czech Republic. As a part of the data collection for my master's thesis, I would like to invite you to participate in this survey by filling in the questionnaire. Your answers will be anonymous and only be used for research purposes. Thank you for your time invested in filling in the questionnaire and responding to the questions.

The use of smart technologies is increasing day by day and the tourism industry is no exception. The role of smart technologies is significantly important from the perspective of tourists. The focus to enhance the satisfaction of tourists and attract them by facilitating them is the major concern of attractions and destinations due to the economic gains of tourism all around the world.

Smart tourism refers to the ability of destinations to implement integrated technology platforms for the benefit of tourists and other stakeholders (Buhalis, Amaranggana, 2015). Cloud computing, artificial intelligence (AI), mobile communication, radio frequency identification devices (RFID), smart devices, augmented reality (AR), virtual reality (VR), mobile payment, mobile communication, social networking sites and tourism related platforms are just a few examples of the technologies and services that are included in smart tourism technologies digitalizing processes and services (Zhang et al., 2022a). Tourists can plan and enhance their travel experiences using all forms of online tourism applications and information sources such as online travel agents, travel applications, personal blogs, public websites, company websites and social media. When traveling, the majority of tourists make use of smart technology including mobile payments via smartphones, WiFi at accommodations, reviews of nearby restaurants, and location searches (Azis et al., 2020)

Furthermore, most of the destinations in the tourism sector use smart technologies to facilitate the visitors and enhance economic gains. Examples of these include self-service ticket machines, self-service kiosks in hotels, self-service flight check-in kiosks at airports, and tour guide systems in travel attractions. By implementing these smart devices, travelers can take advantage of convenient and effective services (Pai et al., 2020). Precisely, in this survey, the tourists are required to share their experience of using smart tourism technologies to provide convenience, such as in online maps and guide, online payment systems, transportation systems, tour bookings, virtual tours, query systems, online recommendations, and digital self-service kiosks, by following the approach of Balakrishnan et al. (2023).

This study aims to investigate tourists' satisfaction with smart tourism technologies (i.e., informativeness, accessibility, interactivity, and personalization) in Istanbul as well as the effects of these technologies on tourists' perceived value of smart tourism technologies, experience satisfaction, word-of-mouth and loyalty.

Demographic information

1. Gender *

Female

Male

2. Age *

Below 20 years

21-35 years

36-45 years

46-60 years

Above 60 years

3. Education*

Below High school

High school

Bachelor's degree

Master's degree

Ph.D. (Doctorate)

Others

4. Occupation *

Student

Employed

Self-employed

Unemployed

Retired

Others

5. Marital Status *

Single

In a relationship

Married

Divorced

Widow/Widower

6. Category of Respondents *

Domestic tourist

Foreign tourist

Part 1. Attributes of Smart Tourism Technologies (Information, Accessibility, Interactivity, Personalization)**1a. Information**

1. When traveling in Istanbul, smart tourism technologies provide me with useful destination and trip information.
2. When traveling in Istanbul, smart tourism technologies enable me to complete my travels with reliable and detailed information.
3. When traveling in Istanbul, smart tourism technologies help to minimize my travel concerns.

1b. Accessibility

1. I can use smart tourism technologies anywhere and at any time during my travels in Istanbul.

2. Smart tourism technologies are easily accessible during my travels in Istanbul.
3. Smart tourism technologies are easily found without complicated processes when traveling in Istanbul.

1c. Interactivity

1. Smart tourism technologies are interactive when I travel around Istanbul.
2. Smart tourism technologies are highly responsive to my travels in Istanbul.
3. It is easy to share information and content on smart tourism technologies during my travels in Istanbul.

1d. Personalization

1. I receive personalized information on smart tourism technologies when traveling in Istanbul.
2. Smart tourism technologies provide me with easy-to-follow links and tips while traveling in Istanbul.
3. Travel information provided by smart tourism technologies meets my needs when traveling in Istanbul.

Part 2. Perceived Value of Smart Tourism Technology Experience

1. The services provided through Smart Tourism Technologies in Istanbul are good value for money.
2. The services provided by Smart Tourism Technologies in Istanbul are good for buying or renting.
3. The services offered by Smart Tourism Technologies in Istanbul look affordable.

Part 3. Tourist Experience Satisfaction

1. Overall, I am satisfied with the smart tourism technologies available in Istanbul.
2. The smart technology available in Istanbul exceeded my expectations.
3. I am satisfied with the quality of services provided using smart tourism technologies in Istanbul.

Part 4. Loyalty

1. I enjoy visiting Istanbul as a Smart Tourist Destination.

2. If I had to choose a destination again, I would choose Istanbul as a Smart Tourist Destination.
3. I will come back soon to visit Istanbul as a Smart Tourist Destination.

Part 5. Word-of-Mouth

1. I would recommend smart tourism technologies to my family, friends and peers.
2. I will tell my family about my positive experiences with Smart Tourism Technologies.
3. I will post positive reviews and comments about Smart Tourism Technologies on social media.