

Reflection of the Digital Transformation Process on the Tourism Sector: A Study on the Use of Smart Tourism Technologies

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Abstract

The purpose of this study was to explore the level of use and experiences of smart tourism technologies by employees and managers in tourism businesses. A nested multiple case design, which is one of the qualitative research designs, was used for this purpose in the study. Face-to-face semi-structured interviews were conducted with 48 employees and managers from two accommodation establishments, two food and beverage establishments, two travel agencies and two airline establishments in Istanbul, which were determined as cases in the study, using the maximum diversity sampling method. The data obtained from the interviews were subjected to content analysis using the Maxqda 2020 qualitative data analysis program. Cloud technologies, big data, QR codes, mobile applications, virtual reality, infrared communication, electronic flight technology, global positioning systems, and digital self-service technologies are used in tourism businesses. It has been determined that employees and managers in tourism enterprises welcome the use of these smart tourism technologies because of their perceived benefits, ease of use, safety, welfare, improving employee performance, enriching recipes, the quality of digital software systems used in enterprises and various organizational support provided for employees. On one hand, it has been determined that smart tourism technologies have various benefits for employees, businesses and customers such as fast service, time saving, competitive advantage, flexible working, sustainability, reduction of airplane accidents, strengthened brand image, increased operational efficiency, correct ordering and the chance to re-order food and beverages while on the other some negativities such as data security problems, service disruption, standardization of food tastes, expensive service, cyber loafing, burnout syndrome and loss of employment have also been determined.

Keywords: Digital Transformation, Smart Tourism Technologies, Tourism Enterprises, Istanbul

Dijital Dönüşüm Sürecinin Turizm Sektörüne Yansımaları: Akıllı Turizm Teknolojileri Kullanımına Yönelik Bir Arařtırma

Öz

Bu arařtırmanın amacı turizm işletmelerinde çalışan ve yöneticilerin akıllı turizm teknolojilerinin kullanım düzeyinin ve deneyimlerinin keřfedilmesidir. Bu amaç doğrultusunda çalışmada nitel arařtırma desenlerinden iç içe geçmiş çoklu durum deseni kullanılmıştır. Arařtırmada durum olarak belirlenen; İstanbul'da yer alan iki konaklama işletmesi, iki yiyecek ve içecek işletmesi, iki seyahat acentesi ve iki havayolu işletmesinden maksimum çeşitlilik örnekleme yöntemiyle 48 çalışan ve yönetici ile yüz yüze yarı yapılandırılmış görüşmeler gerçekleştirilmiştir. Görüşmelerden elde edilen veriler, Maxqda 2020 nitel veri analiz programından faydalanılarak içerik analizine tabi tutulmuştur. Turizm işletmelerinde bulut teknolojileri, büyük veri, karekod, mobil uygulama, sanal gerçeklik, kızılotesi iletişim, elektronik uçuş teknolojisi, küresel konum belirleme sistemleri ve dijital self-service hizmet teknolojilerinin kullanıldığı belirlenmiştir. Turizm işletmelerinde çalışanların ve yöneticilerin bu akıllı turizm teknolojilerini; algılanan fayda, kullanım kolaylığı, güvenlik, refah sağlama, çalışanların performansını arttırması, yemek tariflerinin zenginliğini sağlama, işletmelerde kullanılan dijital yazılım sistemlerinin kalitesi ve çalışanlara bir takım örgütsel destek sağlamasından dolayı kullanmayı kabul ettikleri belirlenmiştir. Öte yandan turizm işletmelerinde akıllı turizm teknolojilerinin çalışanlara, işletmelere ve müşterilere hızlı hizmet, zaman tasarrufu, rekabet avantajı, esnek çalışma, sürdürülebilirlik, uçak kazalarının azalması, marka imajının güçlenmesi, operasyonel verimlilik artışı, doğru sipariş, yiyecek ve içecekleri tekrar sipariş etme şansının olması gibi çeşitli faydalarının yanı sıra veri güvenliği sorunu, hizmet aksaması, yemek tatlarının standartlaştırılması, pahalı hizmet, siber aylıklık, tükenmişlik sendromu ve istihdam kaybı gibi zararları da olduğu tespit edilmiştir.

Anahtar Kelimeler: Dijital Dönüşüm, Akıllı Turizm Teknolojileri, Turizm İşletmeleri, İstanbul

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Introduction

Digitalization is defined as the use of digital technologies in business processes for businesses to generate revenue and value and change existing business models (Gartner, 2022) while the digital transformation process is defined as all changes and interactions resulting from the use of digital technologies such as mobile technologies, internet, artificial intelligence, augmented reality, virtual reality in business processes (Telli & Altun, 2019). This digital transformation contributes to guests experiencing products and services in advance, provides personalized service, guest tracking and solves technical problems that occur in many areas of tourism enterprises especially in the tourism industry, which is a service sector (Pamukçu & Tanrısever, 2019). Therefore, accommodation establishments, food and beverage establishments, travel agencies and airlines have prioritized the importance the digital transformation process and started to use smart tourism technologies such as augmented reality, virtual reality, 3D printers, robots, QR codes in various departments of their businesses (Azadaliyev & Demirkol, 2023).

Among tourism businesses, smart tourism technologies provide important benefits such as automation and personalized service delivery in accounting, human resources and the front office for accommodation businesses while travel agencies benefit from the online sales of products and services, information collection, marketing, product and service experiences; airlines utilize self-service services (mobile boarding pass printing from kiosks and Express Baggage service etc.) and food and beverage businesses use service automation and menu ordering processes that are more hygienic and faster (Sayın & Karaman, 2019). On the other hand, contact free service offered by smart tourism technologies had an important role in protecting the health and sustainability of the guests and employees of tourism enterprises during the Covid-19 pandemic process (Türker & Ertürk, 2020). For this reason, the Covid-19 pandemic process increased the use of smart tourism technologies in businesses and led to changes in the perspectives of both customers and managers regarding smart tourism technologies (Hacıaloğlu & Sağlam, 2021). Accordingly, the aim of the study was to explore the level of use and experiences of smart tourism technologies by employees and managers in tourism businesses (accommodation businesses, travel agencies, food and beverage businesses and airlines). It is anticipated that the reasons for the use of smart tourism technologies by employees and managers in tourism businesses and the benefits and disadvantages of these technologies to businesses will guide sector representatives on which smart tourism technologies to use in their business processes in the future.

Literature Review

Digital Transformation in Tourism Businesses (Accommodation Businesses, Food and Beverage Businesses, Travel Agencies, Airlines Businesses)

Digital transformation activities in hospitality businesses increase the efficiency of the businesses and enable rapid response to guest demands (Li et al., 2024) and offer personalized experiences to guests (Hadjielias et al., 2022). The smart tourism technologies used by accommodation businesses according to their departments are shown in Table 1 below.

Table 1. *Smart Tourism Technologies Used in Hospitality Businesses*

<i>Digital Applications in the Restaurant, Service and Kitchen</i>	<i>Digital Applications in Rooms</i>	<i>Digital Applications in Reservation and Payment Processes</i>	<i>Digital Applications in Guest and Public Relations</i>	<i>Digital Applications in Human Resources Management</i>	<i>Digital Applications in Security Services</i>
Restaurant & Service	Internet of Things (IoT): air conditioning, lighting, curtain control, room temperature control in rooms	Online travel agencies	Chatbots (virtual agents)	Big data	Video surveillance systems
Internet & kiosk-based food ordering	Face and/or voice recognition systems; mobile check-in, check-out	Online booking systems	Holiday assistants	Artificial intelligence	Panic exit equipment

... Table 1.

<i>Digital Applications in the Restaurant, Service and Kitchen</i>	<i>Digital Applications in Rooms</i>	<i>Digital Applications in Reservation and Payment Processes</i>	<i>Digital Applications in Guest and Public Relations</i>	<i>Digital Applications in Human Resources Management</i>	<i>Digital Applications in Security Services</i>
Online table booking	Mobile applications: NFC (keyless entry), door unlocking/locking,	Digital kiosks	Digital concierge services	Personalized online tests	Under-door guillotines
Online virtual menus and content information	RFID operation applications	Service robots (room booking, guest check-in and check-out, and question answering	CRM automation, modules	Online classifieds	Virtual data security
Digital tablet menus	Virtual reality (VR)	Virtual reality (VR)	Big data analysis	Video-based online interviews	Voice command systems
Order tracking automation	Augmented reality (AR)	Augmented reality (AR)		Chatbots	Facial recognition systems (biometric recognition systems)
The Kitchen		E-payment methods: Online payment with credit cards Online payment with virtual cards Pay with mobile apps Pay with mobile wallets Payment via QR codes		Orientation: virtual and augmented reality applications	Smart key systems
Artificial intelligence and robots				HRM automation, modules	
Robot chef					
Robot waiter					
Inventory and supply management automation					
Automation of kitchen equipment management					

Source: Gürsoy & Çalhan, 2024

Smart tourism technologies under the digital applications in restaurant, service and kitchen shown in table 1 above are widely used also by food and beverage businesses (Hazarhun & Yılmaz, 2020). In addition to these technologies, different smart tourism technologies such as 3D printers (Mingshuang et al., 2022), virtual and augmented reality applications (Şahin & Hamarat, 2023), QR code (Hazarhun & Yılmaz, 2021a), autonomous vehicles (Aydın & Çakır, 2022), smart kitchen tools and equipment (smart grinder, smart pan, smart jug, smart refrigerator, smart egg keeper, etc.) are being used in food and beverage businesses (Keşkekci & Gencer, 2023). These technologies help food and beverage businesses to respond quickly to guests' demands and expectations, ensure customer satisfaction and solve any emerging problems quickly (Akay & Karaçeper, 2024).

Virtual reality, augmented reality, artificial intelligence, internet of things, smart tour guidance, smart ticketing and smart travel agency applications have found usage in the field of travel agencies with Industry 4.0 (Saldamlı & Koba, 2020). Digital technologies are said to facilitate existing business, provide efficiency, save time and create a competitive environment in travel agencies. In addition, smart tourism technologies have various benefits for travel agency customers such as easy access to information, product diversity, easy communication regarding various complaints, saving time, benefiting from the products and services of an

agency without the need to go there, facilitated payment, and enabling customers to fulfill their agency transactions easily through mobile applications (Mesci & Biçer, 2024). As in other businesses, airline businesses use blockchain, augmented reality and virtual reality, artificial intelligence, sign technology, robotics, biometrics, big data and analytics, machine learning, internet of things, RFID and barcode-based tracking, GPS tracking, wearable devices, smart sensors both in the realization of the basic functions of the business and in the processes of supply, maintenance, operations and customer relations. In airline businesses, these technologies are beneficial in reducing costs, increasing efficiency, fulfilling customer needs quickly, differentiating and personalizing final products and providing a competitive advantage (Meydan, 2023). Despite the many benefits of smart tourism technologies, the literature also highlights their potential drawbacks. In this regard, several negative consequences have been identified, particularly within tourism enterprises. These include the use of AI-powered robots potentially reducing guest satisfaction due to a lack of human interaction and impacting employment (Ivanov & Webster, 2017; Yıldız, 2019); increased investment costs for tourism businesses; data security risks arising from personal information falling into the hands of malicious actors; unauthorized reproduction of patented products as a result of the replication capabilities of 3D printers; disruptions in the use of digital menus and other technological tools in food and beverage establishments during power or internet outages (Iqbal, Khan & Khalid, 2017); the risk of autonomous vehicles being hacked and used for terrorist attacks by loading them with explosives (Yetim, 2016); challenges experienced by older or more traditional travelers when using smart services at airports (Tuncer, 2021); and the difficulty for travel agencies that cannot keep up with digital technologies to survive, due to the increasing consumer preference for online travel agencies as smart tourism technologies become more widespread (Dilek & Dilek, 2020).

Relevant Studies on the Use of Smart Tourism Technologies in Tourism Enterprises

A review of the relevant literature indicates that various studies have been conducted regarding the adoption of smart tourism technologies within the tourism sector. In this context, Kahraman, İncesu & Küçükergin (2024) explored the implications of digital transformation for the tourism industry. Their study suggests that although digitalization generally enhances customer satisfaction, comfort, and operational efficiency in the transportation and accommodation sectors, it may also result in additional costs such as maintenance and repair, difficulties in recruiting qualified technical personnel, and challenges related to cybersecurity. While digitalization is not anticipated to pose major threats to travel agencies, it may nevertheless lead to certain systemic issues. In a study conducted by Gürsoy & Çalhan (2024), it was emphasized that the prominent digital applications in the service and kitchen areas of restaurant businesses include internet- and kiosk-based food ordering systems, online table reservations, information on food ingredients and virtual menus, as well as the use of artificial intelligence and robotics, such as robot chefs and robotic waiters. Furthermore, in hotel rooms, digital applications featuring Internet of Things (IoT) technologies are increasingly utilized for functions such as unlocking and locking doors, controlling air conditioning and lighting systems, and enabling entry through facial recognition. It was also identified that virtual reality (VR) and augmented reality (AR) applications are used to provide various visual experiences within hotel rooms. Azadaliyev & Demirkol (2023) conducted a literature review using a cost-benefit analysis approach to examine how augmented reality (AR) technology is utilized in tourism, the areas in which it provides benefits, and the problems it addresses. The findings of the study suggest that the digital transformation enabled by augmented reality in the tourism sector holds the potential to create a revolutionary impact within the industry and offer a distinctive competitive advantage for those who choose to adopt such technologies. According to the study conducted by Gundle, Harshe, Kajol, Kinage & Ghanawat (2016) in smart restaurants where wireless technologies are utilized, it is emphasized that such services enable time savings for customers, provide instant e-invoicing, and offer fast parking systems—thereby enhancing customer satisfaction and increasing the profit margins of businesses. These automated systems contribute to time efficiency, reduce human error, improve customer satisfaction, and offer significant advantages for both restaurants and their managers. In their study conducted at the Puro Hotel in Poznań, Jaremen, Jedrasik, & Rapacz (2016) investigated the benefits and characteristics of smart technologies in hotels. Their findings indicate that smart technologies reduce costs and labor requirements, accelerate the delivery of products and services, enable energy savings within the hotel, decrease service error rates, enhance employee productivity, increase the speed of information and document sharing, facilitate archiving processes, and reduce staff workload—thereby allowing more time for the improvement of other operational processes within the hotel. Based on all these studies, the current research questions of this study have been developed as follows:

- *What are the levels of smart tourism technology usage in tourism enterprises (accommodation establishments, food and beverage businesses, travel agencies, and airline companies)?*
- *What are the benefits and disadvantages of smart tourism technologies used in tourism enterprises (accommodation establishments, food and beverage businesses, travel agencies, and airline companies)?*

Method

A qualitative case study design was used to explore the level of use of smart tourism technologies and the experiences of employees and managers in tourism businesses (accommodation businesses, travel agencies, food and beverage businesses and airlines). The case study design was preferred in the study to reveal in-depth and holistic information about the level of use of smart tourism technologies of managers of accommodation establishments, travel agencies, food and beverage establishments and airlines, their experiences and the benefits and disadvantages of the relevant technologies. Yin (2017) put forward a model emphasizing that there were single and multiple case designs in case studies and that there could be a single case or multiple cases within these designs (See Figure 1).

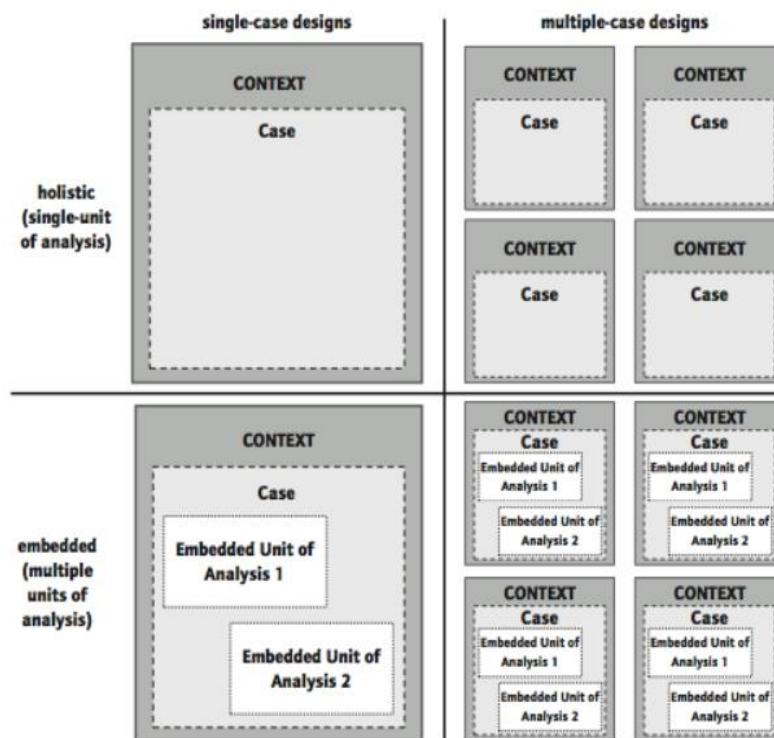


Figure 1. Yin Case Study Designs

Source: Yin, 2017

A nested multiple case design was used within the scope of this study based on the model put forward by Yin (2017) above. A nested multiple-case design is defined as research in which 'more than one case is involved and each case included in the research is divided into sub-units within itself. (Yıldırım & Şimşek, 2013). In this context, the context of the study is the use of smart tourism technologies and the cases are travel agencies, accommodation businesses, restaurant businesses and airlines. Furthermore, the units of analysis of the study are the level of smart tourism technologies usage by managers working in travel agencies, accommodation establishments, food and beverage establishments and airlines, and the benefits and disadvantages provided by smart tourism technologies. Accordingly, since it is difficult to distinguish between the cases, contexts and units of analysis included in the study, a nested multiple case design was used and modeled in Figure 2.

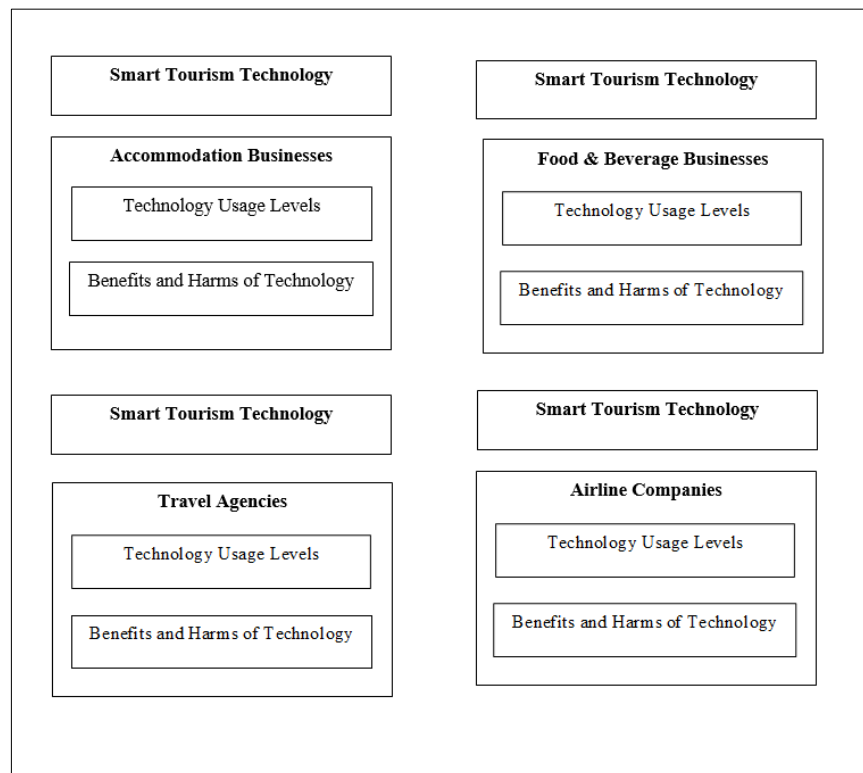


Figure 2. Research Design

Source: Prepared by the authors.

The Process of Determining the Existing Conditions

The main criterion for the researcher in selecting eight tourism businesses as cases was to determine the use of technology in the delivery of products and services in these businesses. Before determining the cases, the researcher examined the websites of eight tourism businesses and as a result of this examination, two accommodation, two food and beverage, two airline and two travel agencies, which were determined to use extensive technology in Istanbul were selected as cases and accommodation businesses were named as K1 and K2, food and beverage businesses as Y1 and Y2, travel agencies as S1 and S2 and airlines as H1 and H2 to protect the confidentiality of the tourism businesses. The contextual information about accommodation establishments (K1, K2), food and beverage establishments (Y1, Y2), travel agencies (S1, S2) and airlines (H1, H2) and the reasons for their selection as case studies are summarized in Table 2.

Table 2. Reasons for Choosing Accommodation Businesses (K1, K2), Food and Beverage Businesses (Y1, Y2), Travel Agencies (S1, S2) and Airlines (H1, H2) as Cases

Accommodation Businesses	Reasons for Selection as a Case
K1	• K1, one of the world's leading hotel companies, is a pioneer especially in hotel technologies, the company enhances the experiences of its guests and offers different experiences to guests by using digital technologies.. • The business has been named on Forbes World's Most Innovative Companies list. • K1 attaches great importance to technology innovations. • K1 hotel has a mobile application and aims to strengthen the hotel's digital resources by making everything from hotel reservation to invoicing smarter with this application.
	• K1 hotel has social media accounts such as Facebook and Instagram and a website. • K1 hotel has state-of-the-art presentation facilities. K1 hotel has high speed internet.
	• K1 hotel has 8 different food and beverage areas and offers innovative services to guests. • Hotel K1 promises an unforgettable accommodation experience. • Hotel K1 follows policies that emphasize sustainability principles. • Hotel K1 has state-of-the-art rooms, personalized services, restaurants and bars. • Hotel K1 aims for the highest level of innovative service.

... Table 2.

Accommodation Businesses	Reasons for Selection as a Case
K2	• K2 hotel's rooms blend luxury and elegance with the latest technology. • K2 Hotel uses advanced technology integrated building control systems. • K2 hotel prefers a smart building system. • K2 hotel uses state-of-the-art technology products in the kitchens of its restaurants.
S1	• S1 agency has accelerated its technology investments since 2005 and continuously improved its technology infrastructure. • S1 agency cooperates with technology companies. • S1 agency's mission statement emphasizes being open to continuous change and innovation and making a difference by using technology. • S1 agency has been awarded the 14th Golden Spider Web Awards twice in the information technologies category. • S1 agency has both iOS and Android supported mobile app, website and social media accounts.
S2	• S2's mission includes technological infrastructure innovations to monitor the rapidly developing dynamic structure of the tourism sector closely and deliver superior service to guests. • S2 has its own mobile application, website and social media tools. • An R&D center has been established as a result of S2's emphasis on digitalization and innovation. This R&D center employs 21 full-time and 11 part-time R&D personnel and carries out numerous projects such as 'Online Supplier Management System', 'Big Data Platform for Analytical Applications', 'Profiling and Analysis Platform with Deep Learning'.
H1	• H1 has been a company that emphasizes a culture of sustainable innovation since the very beginning of its operations and has become an important brand in its sector thanks to this innovation culture. • H1 launched a digital platform called "Terminal". This platform brings together THY's innovation and technology efforts in a single center. • H1 is among the leading companies of digital transformation in Türkiye. • H1's emphasis on digital transformation, which has led to the recent launch of numerous digital infrastructure systems and its partnership with Amadeus to offer personalized services across all platforms and devices for passengers. • H1 signed a cooperation agreement with Huawei and as a result of this agreement, the two companies aim to develop digital applications using artificial intelligence, cloud and big data technologies. • H1's artificial intelligence technology and machine learning to learn the demographic information of passengers and to develop products and services in the light of this information. • H1's development of digital cabin management systems. • H1 attaches importance to digital marketing and thus has Instagram, Facebook, Twitter, LinkedIn and Youtube accounts and an official website. • H1 has mobile application.
H2	• In 2018, H2 entered a digital transformation process. After this process, H2 has focused on digital technologies and unique innovations to facilitate passengers' travel. • H2 received two awards ('Domestic Digital Airline of the Year' and 'Tourism Company Blog of the Year') at the Travel Technology Awards organized by Uzakrota in 2018. • H2 received the 'Digital Trailblazer' and 'Operating Model Master' awards in IDC's Digital Transformation Awards category. • H2 has launched a travel assistant program. • H2 has launched the Electronic Flight Bag (EFB) project in cooperation with Panasonic. • H2 has officially approved Facebook, Twitter, Instagram, LinkedIn accounts. • H2 offers online ticket sales and reservations on its official website. • H2 has a mobile application.
R1	• R1 uses the menulux system. This aims to maximize customer satisfaction by means of a single center. • R1's menu and price updates in other branches are also made from a single center. • R1 has a website and online orders can be placed through the website. • R1 uses a QR code menu. • R1 has social media accounts such as Facebook and Instagram.
R2	• R2 uses the Cyberistanbul smart restaurant and service system. • Orders can be placed from tablet menus thanks to the Cyber Istanbul smart restaurant and service system. • Menus can be integrated with the POS system and kitchen scripts. • R2 has a website, official Instagram and Facebook account.

Source: Prepared by the authors.

Sample Group

After the case identification process was completed, the researcher conducted a pilot study as suggested by Light, Singer & Willet (1990) to finalize the interview forms. The people who were planned to participate in the pilot study were determined with the snowball sampling method. Accordingly, the researcher contacted the managers of K1, S2, H1 and R1 businesses and asked them to suggest people who could provide detailed information. Subsequently, as a result of the suggestions of individuals recommended by the general manager and their guidance, 8 people, including 2 people from K1 hotel, 2 people from S2 agency, 2 people from H1 airline and two people from R1 restaurant were included in the pilot study and the demographic information of these participants is given in Table 3.

Table 3. *Demographic Information on Pilot Study Participants*

Businesses	Participant	Task	Gender	Age	Interview duration
K1	A1	Head of Reception	Male	30	25 min
K1	A2	Sales Marketing Personnel	Female	32	30 min
S2	A3	Sales Officer	Male	38	20 min
S2	A4	Assistant Manager	Male	45	26 min
H1	A5	Chief of Human Resources	Female	37	35 min
H1	A6	Sales Manager	Male	48	42 min
R1	A7	Assistant Manager	Male	50	45 min
R1	A8	Waiter	Male	25	18 min

Source: Prepared by the authors.

After conducting the pilot study, the researcher selected the participants to be included in the main study with maximum diversity sampling. In this context, the researcher aimed to provide diversity by including 48 people with different experiences working in different departments in K1, K2, H1, H2, S1, S2, R1 and R2 enterprises, which were selected as cases. In qualitative research, there are no definite limits on the number of people to be interviewed. Lincoln & Guba (1985) emphasize that the number of samples in qualitative research should be decided according to the saturation and excess of information and assert that when no new information is obtained from the participants, the research can be terminated when the information starts to repeat itself. In this context, the researcher did not make a definite determination about the number of participants to be interviewed in advance. In the researcher's interview with the 46th person, the answers started to repeat themselves and the interviews were terminated at the 47th person. The demographic information of the participants of the main study is shown in Table 4.

Table 4. *Demographic Information of the Participants of the Main Study*

Businesses	Participant	Task	Gender	Age	Interview duration
K1	A1	Front Office Manager	Female	36	25 min
K1	A2	Chief of Human Resources	Female	40	30 min
K1	A3	Accounting Manager	Male	45	40 min
K1	A4	Sales Marketing Manager	Male	42	35 min
K1	A5	Information Technologies Manager	Male	38	25 min
K1	A6	Housekeeping Manager	Female	35	40 min
K1	A7	Security Officer	Male	36	35 min
K1	A8	Waiter	Male	25	25 min
K1	A9	Restaurant Chef	Male	46	38 min
K2	A10	Receptionist	Male	35	27 min
K2	A11	Human Resources Personnel	Female	40	35 min
K2	A12	Assistant Accounting Manager	Male	45	40 min
K2	A13	Sales Marketing Supervisor	Female	40	45 min
K2	A14	Information Processing Officer	Male	35	30 min
K2	A15	Security Officer	Male	38	42 min
K2	A16	Waiter	Female	27	20 min
K2	A17	Restaurant Manager	Male	50	35 min
S1	A18	Assistant Manager	Male	40	23 min
S1	A19	Chief of Human Resources	Female	37	30 min
S1	A20	Accounting Personnel	Male	42	40 min
S1	A21	Sales Officer	Female	38	28 min
S1	A22	Guest Relations Officer	Female	45	35 min
S2	A23	Manager	Male	44	42 min
S2	A24	Human Resources Manager	Female	35	34 min
S2	A25	Domestic Tour Sales Officer	Male	40	28 min

... Table 4.

Businesses	Participant	Task	Gender	Age	Interview duration
S2	A26	Accounting Chief	Male	42	27 min
S2	A27	Assistant Manager	Male	38	35 min
R1	A28	Restaurant Owner	Male	45	25 min
R1	A29	Cook	Male	35	32 min
R1	A30	Waiter	Male	25	27 min
R1	A31	Restaurant Manager	Male	43	40 min
R1	A32	Waiter	Male	25	27 min
R2	A33	Restaurant Owner	Male	50	45 min
R2	A34	Cook	Male	47	20 min
R2	A35	Waiter	Female	35	31 min
R2	A36	Waiter	Male	37	15 min
R2	A37	Cashier	Female	40	17 min
H1	A38	Human Resources Worker	Male	45	35 min
H1	A39	Finance Officer	Male	42	40 min
H1	A40	Information Technology Support Specialist	Male	47	45 min
H1	A41	Guest Services Officer	Female	40	32 min
H1	A42	Director of Information Technologies	Male	45	40 min
H2	A43	Assistant General Manager	Male	42	37 min
H2	A44	(Responsible for Marketing and Sales)	Male	37	28 min
H2	A45	Regional Head of Sales	Male	45	43 min
H2	A46	Finance Officer	Female	42	35 min
H2	A47	Head of Customer Solutions	Female	32	25 min

Source: Prepared by the authors.

Data Collection Tool

In this study, data were collected through semi-structured interviews in both the pilot study and the main study. The reason for choosing the interview method was the researcher's desire to establish a sincere environment by meeting face-to-face with the participants identified by the researcher and thus obtain sincere answers to the research questions from the participants. Interview forms were used in the interviews. The interview forms included 13 questions based on the review of the relevant literature and the opinions of two faculty members working on smart tourism technologies. The semi-structured pilot study was conducted face to face with a total of 8 participants, including two participants from K1 Businesses, two from S2 Businesses, two from H1 Businesses and two participants from R1 Businesses in their offices between September 01, 2021 and September 15, 2021. Each interview lasted approximately 25 to 48 minutes and was recorded with a voice recorder. Two participants attending the pilot interviews stated that two questions in the interview form were not clearly understood. Accordingly, the researchers finalized the interview form for the main study by revising the questions that two participants found problematic. After the finalization of the interview form, the researchers conducted face-to-face semi-structured interviews with 48 people who voluntarily agreed to participate in the research between October 05, 2021 and November 21, 2021 in their offices. The main interviews lasted approximately 25 min to 45 min and were recorded with a voice recorder.

Data Analysis

The recorded data were then transcribed and subjected to content analysis. During the content analysis process, the data were coded and the main themes were formed by combining the obtained codes. The licensed MAXQDA 2020 qualitative data analysis program was used in the data coding process. The researcher asked a faculty member in the field of tourism, who has knowledge in qualitative research to code the data obtained from the participants to ensure the reliability of the research. The aim of the researcher was to ensure consensus among the coders. The faculty member, who accepted the researcher's request, assumed the role of additional coder. The researcher sent all the data to the additional coder. The additional coder coded all the data using the Maxqda 2020 qualitative program like the researcher. After completing the coding process, the two researchers came together and compared the codes and different codes were identified. These different codes were discussed and a consensus was reached.

Validity and Reliability

During the reconciliation process, the code reliability coefficient suggested by Miles & Huberman (1994) was calculated. Miles & Huberman (1994) emphasize that there should be a consensus of at least

80% or more between the researcher's codes and the codes established by the additional coder. Based on this, the researcher used the formula below.

Reliability Coefficient = Number of Agreed Codes / Number of Agreed Codes + Number of Non-Agreed Codes

The calculation revealed a reliability coefficient of 90%. The result shows that a consensus was reached among the coders and therefore the research was declared reliable.

Findings

Seven main themes were identified as a result of the content analysis, namely: “Smart Tourism Technologies Used in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines”, “Covid-19 and Technology Use”, “Barriers to the Use of Technology in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines”, “Technologies Projected to be Used in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines in the Future”, “Benefits and Losses of Smart Tourism Technologies to Employees in Food and Beverage Establishments, Travel Agencies and Airlines”, “Benefits and Losses of Smart Tourism Technology Use to Accommodation Establishments, Food and Beverage Establishments, Travel Agencies and Airlines” and “Benefits and Losses of Smart Tourism Technologies to Guests in Accommodation Establishments, Food and Beverage Establishments, Travel Agencies and Airlines”.

Smart Tourism Technologies Used in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airline Businesses

The main theme and sub-themes of smart tourism technologies used in accommodation businesses, food and beverage businesses, travel agencies and airlines are shown in Table 5 below. Accordingly, the participants emphasized that cloud technologies and big data technology enabled them to store the real-time shares of customers over the internet, birthdays of regular guests, room preferences on their servers and databases in their accommodation establishments and place the information on the QR codes on the tables for guests to access the food and beverage menus in the restaurants of their hotels. They also stated that websites, mobile applications and social media technologies are used in accommodation businesses. In addition, A11 and A12 emphasized that e-invoice, e-accounting receipt applications, ledger declaration system, e-statements, human resources software and electronic document systems are mostly used in online software and e-applications, especially by the accounting and human resources departments of hotels:

Table 5. Main Theme and Subthemes of Smart Tourism Technologies Used in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines

Smart Tourism Technologies			
Accommodation Businesses	Food and Beverage Businesses	Travel Agencies	Airline Businesses
Cloud technologies	QR code	Virtual reality	Infrared communication
Web Sites	Social media	Digital software	Electronic flight technology
QR code	Web site	Social media	Voice Command System
Big Data	Mobile application	Web sites	Wireless
Social Media	Digital software		
• Facebook	• Menulux System		
• Twitter	• Cyberistanbul	Big Data	Global Positioning System
• Instagram	Smart Restaurant and Cafe services		
Mobile Application			
Online software and E-applications			
• E-Invoice			
• E-Accounting Receipt Applications		Cloud technology	Social Media
• Ledger Declaration System			
• E-Declaration			
• Electronic Notification System			

... Table 5.

Smart Tourism Technologies			
Accommodation Businesses	Food and Beverage Businesses	Travel Agencies	Airline Businesses
		Mobile Applications	Big Data
			Mobile Application
			Cloud Technology
			Artificial Intelligence
			• Digital Apron • Robots • Counter Optimization • Chatbot
			Digital Self-Service Service Technologies
			• Kiosks • Mobile Boarding Pass • Express luggage service • Traveling with chip ID cards • Travel assistant program
			Digital Cargo
			Detection Sensor Technology

Source: Prepared by the authors.

'The accounting department of our hotel has also been digitized. Invoices are currently sent to customers' e-mails electronically, unless a hard copy is requested by customers. In addition, the most important benefit of digitalization for accountants is that the transactions that we need to report to the tax office, such as value added tax, stamp tax and income tax, are now reported to tax offices in a digital environment thanks to the e-declaration. Digitalization has been very useful for accountants (A11).'

'The human resources department has also received its share of digitalization in recent years and our business processes have become easier thanks to this digitalization. We use sap software in our hotel. Thanks to this software, salary and compensation calculations of the personnel are easily calculated. We also have a good understanding of employee experiences. You ask how we do this. The software is integrated with artificial intelligence and machine learning technology. This way, we HR employees can perform effective forecasting analysis and strategic workforce planning. (A12).'

Participants in food and beverage establishments reported that they use QR menus in their establishments. In this context, they stated that they placed QR codes on the tables in their businesses and that the waiters directed the guests to use the QR codes. On the other hand, it was emphasized that a mobile application was also used in R2 businesses. This mobile application includes menus and special souvenir food and beverage packages for guests. Users order the food and beverages they want through the mobile application. Participants stated that digital software is used in their businesses. It was determined that the Menulux system was used in R1 establishments. It was emphasized that the Menulux system is a new generation restaurant automation application in restaurants and that it was the first mobile sales system using cloud technology that works on android devices in Türkiye. The participants stated that Cyberistanbul, a smart restaurant and service system, is used in R2 restaurants. It was emphasized that thanks to CyberIstanbul, the smart restaurant and service system, orders are placed from tablet menus and the menus are integrated with the POS system and kitchen texts.

In travel agencies, participants emphasized that they use social media, which is one of the important elements of digital marketing, especially in product and service promotion, and that they benefitted from websites and mobile applications. Other technologies used by the participants in travel agencies include virtual reality, digital software, big data and cloud technology. The views of some participants on the subject are as follows:

'Our agency started to invest in virtual reality technology in 2018. In this context, we have purchased virtual reality goggles for the agencies and the guests coming to the agency have the chance to experience the places they want to spend their vacations with 360-degree videos with these goggles beforehand (A19).'

'As an agency we attach great importance to technological development. Before the pandemic, we established a technology company, which builds all our technological infrastructure. Thus, we use our own digital software within the agency (A25).'

Participants emphasized that digital self-service technology has been used in airline businesses, especially recently, to ensure fast transactions and passenger satisfaction. Some participants mentioned that the use of artificial intelligence technologies has become widespread in airlines and that especially digital apron systems, robots and chatbots are used in this context, and that counter optimizations that will model the estimated waiting times of customers at the counters with cameras have come into play. Participants underlined that infrared communication, electronic flight technology, voice command system, wireless, global positioning systems and digital cargo services are also being used in airlines in addition to artificial intelligence and digital service technologies.

Reasons for Using Smart Tourism Technologies in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airline Businesses

The main theme and sub-themes of the reasons for the use of smart tourism technologies in accommodation businesses, food and beverage businesses, travel agencies and airline businesses are shown in Table 6. Participants emphasized that they found smart tourism technologies very useful in accommodation businesses recently because they facilitated their job descriptions and shortened their work time. Some participants stated that they enthusiastically use smart tourism technologies in hotel businesses because the technologies provide more reliable data, are easy and fun to use while performing their tasks. They also emphasized that they prefer smart tourism technologies in travel agencies because they find them easy to use, beneficial for their work, increase their work performance and reliable. The opinion of participant number 19 on the subject is as follows.

'The digital software used in our accounting and human resources departments is both easy to use and provides reliable information. Therefore, we can make important strategic plans for the future (A19).'

Table 6. Main Theme and Subthemes of Reasons for Using Smart Tourism Technologies in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airline Businesses

Reasons for Using Smart Tourism Technologies			
Accommodation Businesses	Food and Beverage Businesses	Travel Agencies	Airline Businesses
Perceived benefit	Provides a wealth of recipes	Reliability	Reliability
Ease of use	Quality of digital software systems	Ease of use	Ensured well-being
Trustworthiness	Organizational support	Perceived benefit	Ease of use
Fun to use		Performance enhancing	Perceived benefit
Shortens working time			

Source: Prepared by the authors.

Participants in food and beverage businesses emphasized that they learned various recipes from smart tourism technologies, especially through social media and various mobile applications, and that they used these systems because the digital software systems used in their businesses offer quality applications. Among the reasons why R1 and R2 participants preferred smart tourism technologies in their businesses is that these technologies give more importance to the hygiene of personnel working in the businesses, the software that reduces the workload of the personnel is integrated into the business processes and provides organizational support in the business, and the digital software (Menulux and Cyberistanbul smart restaurant and service system) used in the businesses other than social media and QR code application are easy to use by the managers. Likewise, the participants in airline businesses emphasized that they use smart tourism technologies because they provide benefits in fulfilling their job descriptions in the workplaces, they are easy to use, they ensure the safety of employees; they use smart tourism technologies because they increase the welfare of employees by providing serenity, spiritual and mental balance in the working environment.

Covid-19 and Technology Use

The main theme and sub-themes of Covid-19 and technology use in accommodation businesses, food and beverage businesses, travel agencies and airlines are shown in table 7. It is emphasized that the Covid-19 pandemic has rapidly spread the use of technology in accommodation businesses and raised the awareness of both guests and managers regarding these technologies. The opinion of participant A10 supporting this issue is as follows:

"In the past, our guests were not very interested in using our mobile app. We have a mobile application at the reception. This application enables you to check-in and benefit from many of our services. During the pandemic, guests started asking us, "Do you have a mobile application?" What services can we get with this mobile application? Guests are also exploring contact free services realized through a mobile app. Awareness of technology has increased (A10)."

Participants in food and beverage businesses emphasized that technologies that minimize contact such as QR code technology and mobile applications came into play when the pandemic entered our lives, especially in their businesses, and that these technologies have an important impact on making strategic decisions.

Table 7. *Main Theme and Subtheme of Covid 19 and Technology Use in Accommodation, Food and Beverage, Travel Agencies and Airline Businesses*

Accommodation Businesses	Food and Beverage Businesses	Travel Agencies	Airline Businesses
Acceleration of technology use	Increase in online meetings	Increased interest of employees in technology	Acceleration of technology investments
Increased awareness of technology products and services	Emergence of the ghost kitchen concept	Change the way of working	
	Widespread use of technology		
	Making strategic decisions		

Source: Prepared by the authors.

In travel agencies, the participants emphasized that the personnel working after the Covid-19 pandemic period were more interested in technology and digital processes and that the working styles in travel agencies changed and remote working started. Similarly, it was emphasized that the use of technology gained momentum in airline businesses, especially at airports during the pandemic process and importance was given to providing contact free service to prevent disease contagion.

Future Technologies to be Used in Hospitality, Food & Beverage Businesses, Travel Agencies and Airlines

The main theme and sub-themes of the technologies that should be used in accommodation businesses, food and beverage businesses, travel agencies and airline businesses in the future are shown in Table 8. In accommodation businesses, it is emphasized that in the coming years, participants will be able to attend hologram concerts by world-famous artists in the hotel rooms, garden or lobby, meals produced with 3D printers will be served to guests in restaurants, personalized menus will be created as a result of DNA analysis, and all payments will be made with DNA in the hotel as a result of the identification of the DNA of the guests. Participant K12 emphasized that he read a news article in a technology magazine that thanks to neurotechnology, in the future hotel guests would experience the dream of their choice by choosing a dream theme and he thinks that this technology will be offered by hotels in the near future and commented on the subject as follows:

'I saw the article in a magazine last month. Look at the future of technology. Thanks to neurotechnology, it will be possible to dream whatever you want to dream about before you fall asleep. Imagine, in my dream I want to be on a safari tour in Africa. In my dream I go on a safari tour in Africa. Even though it seems hard to imagine now, I think this technology will enter our lives in the future (K12).'

Table 8. *Main Theme and Subtheme of Future Technologies to be Used in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airline Businesses*

Accommodation Businesses	Food and Beverage Businesses	Travel Agencies	Airline Businesses
Hologram Concerts	Food selection with DNA analysis	Metaverse	Three-story airplanes
3D printers	Teleporting	Teleporting	Flying taxis
Mobile payment and food choices as a result of DNA Analysis	Robot Restaurant		Hypersonic airplanes
			Electric airplanes
			Solar powered flights

Source: Prepared by the authors.

Barriers in the Use of Technology in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines

The main theme and sub-themes of the barriers in the use of technology in accommodation businesses, food and beverage businesses, travel agencies and airlines are shown in Table 9. Participants from accommodation establishments emphasized that the hotel buildings are old and therefore their technological infrastructure is old. They underlined that it is more difficult to expand the use of smart tourism technologies in their hotels due to the old infrastructure. On the other hand, it has been determined that the integration

of smart tourism technologies such as virtual reality, hologram technologies, augmented reality into hotels is costly, the scarcity of local technology suppliers and the unwillingness of employees who are fond of tradition to use new technologies constitute obstacles to the use of smart technology. The participants also stated that the high costs of integrating smart tourism technologies into food and beverage businesses, the lack of interest in incentive policies by the state and local governments due to the high cost of smart tourism technologies, the lack of interest of food and beverage business owners in technological investments as well as giving more consideration to humans by bosses in food and beverage businesses stand in the way of smart tourism technologies.

Table 9. *Main Theme and Subthemes of Barriers to the Use of Technology in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines*

Accommodation Businesses	Food and Beverage Businesses	Travel Agencies	Airline Businesses
Lack of technology infrastructure	Lack of state and local government incentives	High cost	Covid 19
Lack of local suppliers	Value attributed to people	Number of traditionalist staff	Failure to choose the right digital strategy and transformation roadmap
Traditional employees	High Cost	Complexity of software	Resistance to Change
Cost of Technology	Lack of enthusiasm of bosses for technology investments	Covid 19	Security concerns

Source: Prepared by the authors.

The participants emphasized that the barriers in using smart tourism technologies in travel agencies include the cost of these technologies and the inability of agencies to make a rapid technological investment at the moment due to the decrease in their revenues during the Covid-19 pandemic. The same reason was found to be valid for airline businesses. In addition, traditionalist staff working in travel agencies and their lack of interest in new technologies, as well as the complexity of the software use of some technologies used in the businesses are cited as other barriers to smart tourism technologies, while in airline businesses, factors such as the airlines' inability to choose the right digital strategies, resistance to technological change by employees within the organization, and the fact that digital technologies sometimes cause problems in terms of data security come to the fore. Some of the views expressed by participants on this issue are as follows:

'The digital transformation process is important for airlines to move forward. It is important to choose digital technologies that work and are appropriate for the current conditions. Sometimes, failing to choose the right digital strategies and roadmaps causes significant barriers regarding technology adoption (A47).

'Sometimes our in-house technology company comes up with various software. Employees can sometimes be resistant to new software (A46).'

Benefits and Disadvantages of Smart Tourism Technologies to Employees in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines

The main theme and sub-themes of the benefits and disadvantages of using smart tourism technologies for employees in accommodation establishments, food and beverage establishments, travel agencies and airline companies are shown in Table 10. The participants emphasized that the workloads in accommodation businesses have decreased more after the use of smart tourism technologies; online meeting programs (Zoom, Google Meet and Microsoft Teams etc.) enabled a more flexible working order, easy information sharing among themselves and with their customers through online hotel software or social media applications were listed as benefits provided by smart tourism technologies. Other benefits of smart tourism technologies to employees listed by the participants included the emergence of new professions in accommodation businesses, time saving in the workplace thanks to digital software, and increased productivity in the workplace as employees turned to different jobs in the remaining time during working hours. Participants emphasized that smart tourism technologies in accommodation businesses had negative as well as positive aspects. Participants stated that especially employees who were unable to keep up with technology resigned from their workplaces and increased the labor turnover rate, working by looking at a smartphone or computer screen for a long time caused various health problems, including eye and headaches, reduced employment, and employees focussed more on their computers and smartphones and communicated less among themselves.

Participants in food and beverage businesses emphasized the benefits of smart tourism technologies as working remotely efficiently during the pandemic thanks to the development of technology, transferring important information and documents for employees to the virtual environment, ensuring the occupational safety of employees with the extensive use of camera systems in workplaces, improving customer and staff health with the use of contact free technologies, analyzing the demands and expectations of customers with big data technology and meeting customer demands effectively and increasing employee motivation. In addition, some participants also considered factors such as decrease in control and decision processes in product and service management thanks to digital software, burnout syndrome experienced by employees as a result of the fast pace generated enabled the bosses' to reach employees at all times with social media and developing technologies and the disabling of digital software by cyber-attacks as among the negative aspects of technology. Some of the participant views on these factors are as follows:

'Zoom came into our lives and destroyed consideration. They also frequently reach you on Whatsaap. If you don't reply, they reach you on social media. Thanks to technology 260, you are accessible 24 hours a day and this causes burnout syndrome (A35).

'There were no stock tracking systems in the past. Sometimes we used to consume some of the food and drinks after work to reward ourselves when we were working hard. Now there are systems. We have less control. Again, decisions are taken on many issues thanks to the reports of smart systems. Employees have less chance to make decisions on their own now (A32).

Table 10. Main Theme and Subtheme of Benefits and Disadvantages of Smart Tourism Technologies to Employees in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines

Accommodation Businesses	Food and Beverage Businesses	Travel Agencies	Airline Businesses
Benefits	Benefits	Benefits	Benefits
Reduced workload	Efficient remote working	Time saving	Online training courses
Flexible working	Transferring information and documents to virtual environment	Facilitated work	Access to information
Easy information sharing	Increase in occupational health and safety	Taking care of family more easily with remote work	Problem solving
Increase in Productivity		Personal development	Strengthening collaboration between employees
Time saving			
Development of new professions			
Disadvantages	Disadvantages	Disadvantages	Disadvantages
Increased labor turnover rate	Reduced employee control and decision-making processes	Loss in Employment	Digital eye strain syndrome
Health problems	Burnout Syndrome	Longer work at home	Monitoring the private life of employees
Disruption of social communication	Data security issue		
Inhibition of creativity	Cyber loafing		
Decline in employment			

Source: Prepared by the authors.

In travel agencies, participants see the benefits of smart tourism technologies as spending more comfortable time with their families by doing their remote work without interruption and increasing their personal development by watching videos on digital transformation through social media tools. On one hand, work is done faster in travel agencies through technologies and as a result, less personnel is needed, leading to loss of employment is considered a disadvantage incurred by smart tourism technologies in travel agencies. On the other hand, they complained that they were sometimes called to meetings at very late hours when they were at home and that Zoom technology caused long working hours.

The participants in airline businesses stated that the benefits of smart tourism technologies include providing distance education activities to employees, especially through applications such as Zoom, availability of many resources on the internet for the personal development of employees and easy access to information, easier solving of problems and business errors that occur in business processes in departments with technological software, and strengthening cooperation among employees with texts shared on the drive and shared by employees. The opinions of some participants supporting these benefits are as follows:

'Technology has evolved and now we can get the trainings we want online from home during the weekend or at night. Last week I took a one-week online training on digital marketing (A47).'

'A lot of resources on the internet are now open access, so people can access the information they need very easily. I think these are the blessings of technology (A48).'

It was emphasized by the participants that smart tourism technologies in airline businesses, as in other tourism businesses, have disadvantages. In particular, the participants emphasized that they had vision problems after a certain period of time from looking at the screens of computers and tablets for extended periods of time at work and that senior management monitored the private lives of employees through social media.

Benefits and Disadvantages of Smart Tourism Technology Use for Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines

The main theme and sub-themes of the benefits and disadvantages of smart tourism technology use for accommodation businesses, food and beverage businesses, travel agencies and airline businesses are shown in Table 11. Participants stated that smart tourism technologies provide differentiation compared to competing hotel businesses by offering diversity in the products and services of accommodation businesses, increase the loyalty of hotel guests, strengthen the brand image of hotel businesses, make it easier for hotel businesses to promote, websites and social media increase sales, other benefits of smart tourism are mobile applications and social media tools that facilitate communication between suppliers and guests, cloud technologies enable the storage of guest information, reduce costs, save electricity, save water and support sustainability by eliminating paper waste online billing systems. In addition to these benefits, the disadvantages of smart tourism technologies include the high cost of integrating them into the business processes of hotels, the possibility of losing confidential information of guests as a result of cyber-attacks, and the high salaries of people who have the skills to use more complex technologies related to software in businesses. The views of some participants on the subject are as follows:

'Our hotel has been subjected to cyber-attacks from time to time. Fortunately, we have never had any staff or guest's information stolen. But unfortunately technology is not always secure (A5).'

'Smart tourism technologies are expensive, especially technologies such as integrating augmented reality technology into menus. Such expensive technologies put a strain on the hotel's budget (A12).'

Table 11. Main Theme and Subthemes of Smart Tourism Technology Usage in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airline Businesses

Accommodation Businesses	Food and Beverage Businesses	Travel Agencies	Airline Businesses
Benefits	Benefits	Benefits	Benefits
Supports Sustainability - Saves energy - Saves water - Prevents paper waste	Increased profitability and efficiency	Establishment of a customer database	Reduction in airplane accidents
Strengthens brand image	Product differentiation	Sustainability	Cost reduction
Guest Loyalty	Fast feedback from customers	Economic efficiency	Reinforces brand image
Differentiation from competitors	Ensures business continuity	Effective marketing & promotion activities	Increased operational efficiency
Facilitates promotion			Reduction in plane crashes
Accelerates sales			Data security issue
Easy communication with suppliers and guests			
Data storage			
Cost advantage			
Disadvantages	Disadvantages	Disadvantages	Disadvantages
Lack of security	Food flavors become standardized	The end of traditional agencies	Data security issue
Expensive	Security issue	Virus transmission	Airplane crashes are triggered
Employment of highly paid specialists	Similar recipes are made quickly		

Source: Prepared by the authors.

Participants in food and beverage businesses emphasized that thanks to websites, social media and mobile applications, product sales have increased and the profit rates of businesses have also increased. In addition, it has been determined that these tools contribute to increased productivity in businesses by helping employees in their work processes. In addition to these benefits, the participants stated that 3D printers, even if not used in their own businesses, distinguished them from other businesses by changing the appearance of foods, receiving instant feedback from social media accounts about customer satisfaction, and technology played an important role in ensuring the continuity of businesses by providing more hygienic service delivery especially during the pandemic period. Some participants emphasized that as a result of the widespread use of recipes through social media and mobile applications, chefs produced dishes with similar flavors and underlined that smart tourism technologies were also harmful to businesses because of the widespread use of similar recipes in business menus. The fact that smart technologies would cause security problems in food and beverage establishments as a result of cyber-attacks like in accommodation establishments was reiterated.

Participants from travel agencies emphasized that databases containing customer information are established thanks to big data and cloud technologies, sustainability is ensured with e-vouchers, effective promotion and marketing of agency products and services are carried out through mobile applications and social media, and finally, economic efficiency is increased through e-commerce and digital marketing on agency websites. The views of some participants on the subject are as follows:

'We promote and market our tour packages and services to both domestic and international customers effectively through our mobile applications and social media accounts such as Instagram and Facebook (A27).'

'Efficiency within the agency is ensured by realizing online sales through our website and digital marketing activities (A29).'

Participants also said that smart tourism technologies are harmful in travel agencies, especially tablets and computers are infected with viruses and smart tourism technologies created obstacles to the sustainability of traditionalist agencies that do not use digital technologies. Participants in airline businesses stated that digital technologies used by the airline and in-flight reduced aircraft accidents, airlines' investment in digital technologies reinforced the brand image of airlines, technology decreased costs by reducing both personnel and fuel costs and increased operational efficiency. Contrary to the fact that smart tourism technologies in airlines reduce airplane accidents, participant A47 stated that sometimes the frequencies emitted from smartphones in the airplane affect the sensitive devices of the airplanes and this can trigger airplane accidents. On the other hand, the participant emphasized that important personal information of passengers can also be exposed to malicious people after cyber-attacks.

Benefits and Disadvantages of Smart Tourism Technologies to Guests in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines

The main theme and sub-themes of the benefits and disadvantages of smart tourism technologies to guests in accommodation businesses, food and beverage businesses, travel agencies and airlines are shown in Table 12. The benefits of smart tourism technologies to customers are as follows: customer satisfaction is ensured, fast service delivery is ensured in hotel businesses thanks to technologies, and the fact that customers find smart tourism technologies, especially QR code menus, fun and different. On the other hand, the participants also emphasized that smart tourism technologies had the potential to cause harm to guests. Participants stated that the high cost of accommodation in hotels where smart tourism technologies are widely used, and sharing the information of guests by malicious people as a result of cyber-attacks could be problematic to guests.

Participants in food and beverage establishments emphasized that on account of smart tourism technologies, customers now have the chance to order faster, they have more hygienic and healthy service thanks to QR code and tablet menus, they can order directly and thus minimize human error and increase the rate of correct ordering, and finally, thanks to mobile applications, customers can add the foods they like in the menu to the favorites section and have the convenience of choosing the same food and beverages again. Participants emphasized that using only smart tourism technologies in food and beverage establishments was a disadvantage that caused service disruption. Participant A35 explained this situation as follows.

"Some road work was done last month. We had a power cut at the workplace. We had no generator. All services were disrupted. Guests complained a lot. Therefore, smart tourism technologies are great, but when the internet is cut, service delivery can be interrupted." (A35).

Table 12. Main Theme and Subthemes of Benefits and Disadvantages of Smart Tourism Technologies to Guests in Accommodation Businesses, Food and Beverage Businesses, Travel Agencies and Airlines

Accommodation Businesses	Food and Beverage Businesses	Travel Agencies	Airline Businesses
Benefits	Benefits	Benefits	Benefits
Customer satisfaction	Orders are correct	Purchasing products and services without time and place limitations	Fast service
Acceleration in service delivery	Speed	Customer satisfaction is ensured	Health & Hygiene
Personalized service delivery	Health and hygiene	Pre-purchase experience is available	
Fun and different experience	Ordering the same food and beverage again is easy		
Disadvantages	Disadvantages	Disadvantages	Disadvantages
Information security issue	Service interruption	Disclosure of personal information	Higher airfare prices
High accommodation costs		Elderly customers are challenged by online purchasing	Data security issue

Source: Prepared by the authors.

The participants underlined that the benefits of smart tourism technologies for customers in travel agencies include the purchase of products and services from the mobile application or website without any online time limitation and pre-purchase product and service experience with various technologies such as virtual reality or Metaverse ensuring customer satisfaction. Contrary to these beneficial aspects, the participants also cited the loss of customers' personal information to malicious parties as a result of cyber-attacks and the challenges for elderly customers to purchase products and services from mobile applications on computers or smartphones as examples of the disadvantages of smart tourism technologies. Participant A24's opinion on the subject is as follows:

'The credit card information of customers can be stolen as a result of cyber attacks on websites. This hasn't happened to us yet, probably because our site is protected by our software. However, we cannot overlook the fact that technology also has a harmful side (A24).'

Participants in airline businesses emphasized that thanks to kiosks, express baggage service and mobile applications, passengers obtained boarding passes quickly, delivered their luggage, got information about airline services, and received healthier and more hygienic services during the pandemic, and assessed smart tourism technologies as beneficial. Participant opinions supporting this issue are as follows;

'Kiosks have been activated. Now, our passengers can print their boarding passes from a kiosk themselves without waiting in line at the counters and collect their luggage tags and drop off their luggage. This way passengers have fast service (A42).'

'Our self-service digital technologies offered healthy and hygienic service to customers during the pandemic (A46).'

It was stated that smart tourism technologies have harmful aspects in airline businesses as in other tourism businesses. Participant A46 emphasized that passenger ticket prices had increased as a result of the expenses incurred by the technological investments made during the pandemic period, and underlined that these increases can jeopardize the purchasing power of passengers. Participant A41 also stated that sometimes security problems occurred as a result of passengers typing their credit card information into mobile applications.

Conclusion and Discussion

The purpose of the study was to explore the level of use and experiences of smart tourism technologies by employees and managers in tourism businesses (accommodation businesses, travel agencies, food and beverage businesses and airlines). In line with this purpose, nested multiple case design, one of the qualitative research designs, was used in the study. Face-to-face semi-structured interviews were conducted with 47 employees and managers from two accommodation establishments, two food and beverage establishments, two travel agencies and two airlines in Istanbul, which were identified as cases in the study with the maximum diversity sampling method. The data collected as a result of the interviews were subjected to content analysis using the licensed MAXQDA 2020 program. The results of the research revealed that smart technologies such as QR code, digital software, social media, websites, cloud technologies, e-invoice, human resources software, e-accounting receipt applications, online software and e-applications including ledger

declaration systems, e-declaration and electronic notification system and big data are used in accommodation businesses, food and beverage businesses and travel agencies. In addition, technologies used by airline operations included infrared communication, electronic flight technology, voice command system, wireless, global positioning system, social media, big data, mobile application, cloud technology, artificial intelligence, digital cargo and digital self-service technologies. An examination of related literature shows that these research findings are similar to the results of the studies conducted by Gürsoy & Çalhan (2024), Keřkekci & Gençer (2023), Meydan (2023), Türkiye (2021), Yazıcı & Eroğlu (2021) and Hazarhun & Yılmaz (2020).

It is predicted that advanced technologies will be used in tourism businesses in the coming years (Hazarhun & Yılmaz, 2021b). As stated by Canton (2016), the participants in this study emphasized that in the future guests would benefit from hologram concerts in accommodation businesses, hotel payment transactions with DNA analysis, 3D printers, neurotechnology and choose their dreams. It has been concluded that food and beverage businesses will deliver package service by teleporting in the future, menus will be established as a result of DNA analysis and restaurants where robots work will be available. Although the use of robots in restaurants has become widespread in the world (Kayran, 2021), they were not used in the two restaurants selected as cases in Istanbul. On the other hand, it is predicted that teleporting and Metaverse technologies will be used in travel agencies in the future, and triple-deck aircraft, electrically operated aircraft, airborne taxis, hypersonic planes and solar-powered planes will be used in airline businesses. Employees and managers emphasized that they use these various smart tourism technologies because they find them useful for the fulfillment of their duties in tourism businesses, they are easy to use, they are reliable, they provide a fun experience, shorten their work time and increase performance. In addition, it has been determined that food and beverage businesses especially prefer to use smart tourism technologies because they enhance recipe richness. On the other hand, the researchers emphasized that there are some obstacles to the use of smart tourism technologies in tourism enterprises even if they are willing to use them. These obstacles are can be listed as follows: the old structure of accommodation businesses and therefore the lack of technological infrastructure, the lack of local companies producing smart tourism technologies, the high cost of smart tourism technologies, the fact that businesses value people more than robots and the resistance to change among employees, the inability to choose the right digital strategy and transformation roadmap, and the security concerns of employees.

It was determined that the use of smart tourism technologies and employees' awareness of these technologies increased during the Covid-19 pandemic process in tourism enterprises. It was concluded that the Covid-19 pandemic has popularized the ghost kitchen concept, increased online meetings and promoted strategic decision-making especially in food and beverage businesses. In travel agencies the Covid-19 pandemic process resulted in travel agency employees showing more interest in technology and changing the way they work. The International Labor Organization (2020) also emphasized that many enterprises switched to remote working after Covid-19. In this context, the finding that working styles have changed is commensurate with the literature.

It has been determined that both the existing technologies and the technologies that are foreseen to be used in the future in tourism enterprises have beneficial and harmful aspects for the enterprises. These benefits include strengthening the brand image of tourism businesses, ensuring guest satisfaction, distinguishing the products and services of hotels among their competitors, facilitating the sale of products and services by enabling the promotion of businesses, easy communication with suppliers and guests within the hotel, storing guests' information and reducing costs. In addition to these benefits, participants also concluded that smart tourism technologies reduce the use of paper in hotels, save water and energy, and reduce airplane accidents. Smart tourism technologies provide various benefits to the guests of food and beverage establishments such as fast service, accurate order delivery, hygiene, health and choosing the same food again thanks to the favorite option of mobile applications. The finding of fast service and accurate order delivery is commensurate with the result of Atçı & Ada (2017).

Smart tourism technologies also offer benefits to employees and guests in tourism enterprises. Smart tourism technologies reduce the workload of employees, enable flexible working conditions, facilitate the flow of information between employees, ensure productivity, save time and enable the emergence of different professions in accommodation businesses. In addition, it was concluded that smart tourism technologies enable travel agency employees to benefit from personal development and be more involved with their families through remote working. The finding of being more involvement with families through remote working is supported by the study conducted by Çetin & Göktepe (2020). On the other hand, these

technologies provide customers with fast service delivery, customer satisfaction, the opportunity to experience products and services beforehand, personalized service, entertainment and different experiences. In addition, smart tourism businesses provide healthy and hygienic presentation in both airline and food and beverage businesses as well as various benefits such as accurate order delivery and choose the same food again in food and beverage businesses.

Smart tourism technologies have disadvantages as well as benefits for tourism businesses. The disadvantages of smart tourism technologies to hospitality businesses are identified as revealing the confidential information of guests, high costs of technologies and the employment of highly paid staff specialized in technology. It has been determined that smart tourism technologies are also harmful to food and beverage businesses due to the standardization of food flavors, security problems and the rapid spread of similar recipes. It has also been emphasized that smart tourism technologies will put traditional agencies out of business. Among the disadvantages of using digital technology in airline businesses include the data security problem, which is also considered among the disadvantages of technology in the three other tourism businesses, and the digital eye fatigue syndrome underlined by Bostancı (2016). On the other hand, it has been determined that smart tourism technologies will lead to the resignation of employees who can not keep up with the digital age, the occurrence of various health problems in employees, prevent creativity, promote cyber loafing, data security problems, burnout syndrome and decrease the control and decision-making processes of employees, prevent social communication among employees and decrease employment by spreading automation. In addition, it has been concluded that the private lives of employees are being monitored by airline companies through social media.

Finally, these smart tourism technologies are also considered to be a disadvantage for guests due to factors such as the disclosure of guest information, hotels using smart tourism technologies are expensive, and as Atçı & Ada (2017) emphasize, services are disrupted when the internet is unavailable. These findings coincide with the studies of Farrias&Cancino (2021) and Gökalp & Eren (2016). The difficulty of online purchasing by elderly customers in travel agencies, increase in air ticket prices and the violation of passenger rights due to the risk of disclosure of passengers' confidential information are among the disadvantages of these technologies to passengers.

As a result of the research, it is believed that the top management of accommodation establishments, food and beverage businesses, travel agencies, and airline companies will pay increased attention to the adoption of smart tourism technologies. Accordingly, the following recommendations have been developed for practitioners in the tourism sector:

- Greater investment should be made in virtual reality, mixed reality, and augmented reality technologies within tourism enterprises to provide guests with pre-purchase experiences of products and services.
- Smart tourism technologies offered to employees should prioritize user-friendliness and facilitate their daily lives.
- Collaboration between tourism enterprises and universities should be strengthened by organizing training programs led by academic experts in tourism technologies to raise employee awareness of these technologies.
- To address data security issues and prevent service disruptions within departments, tourism enterprises particularly hotels should employ new-generation digital technology specialists such as computer and software engineers in the near future.
- Tourism enterprises should abandon their traditional structures to achieve digital transformation, and a clear roadmap for digital transformation in tourism should be developed.
- Governments should promptly enact laws and regulations in the field of artificial intelligence to prevent security problems arising from smart technologies in tourism enterprises.
- To mitigate resistance to change among older and more traditional employees, human resources departments should effectively communicate the benefits of smart tourism technologies to these staff members.

In this study, two accommodation establishments, two food and beverage establishments, two travel agencies and two airlines located in Istanbul were taken as cases by using a case study design. In this context, the fact that the businesses selected as cases are located in Istanbul can be considered as a constraint of the research and in future studies, the level of use of smart tourism technologies by tourism businesses located in different cities, in Türkiye and in the world, can be examined comparatively. The level of using smart

tourism technologies by tourism enterprises and the benefits and disadvantages of these technologies were investigated with a qualitative research method in this study. However, in future studies, by developing a scale or using various technology acceptance models in the literature, the level of using smart tourism technologies can also be revealed by quantitative research methods with a sample that includes both employees and customers of tourism enterprises.

Ethical Declaration

During the writing process of the study titled “*Reflection of the Digital Transformation Process on the Tourism Sector: A Study on the Use of Smart Tourism Technology*”, scientific rules, ethics and citation rules were followed; no falsification was made on the collected data and this study was not sent for evaluation to any other academic publication environment. The necessary ethics committee permissions were obtained at the meeting of Dokuz Eylöl University Social and Human Sciences Scientific Research and Publication Ethics Committee dated 02.11.2021 and numbered 25.

Etik Beyan

“*Dijital Dönüşüm Sürecinin Turizm Sektörüne Yansımaları: Akıllı Turizm Teknolojileri Kullanımına Yönelik Bir Araştırma*” başlıklı çalışmanın yazım sürecinde bilimsel kurallara, etik ve alıntı kurallarına uyulmuş; toplanan veriler üzerinde herhangi bir tahrifat yapılmamış ve bu çalışma herhangi başka bir akademik yayın ortamına değerlendirme için gönderilmemiştir. Gerekli olan etik kurul izinleri Dokuz Eylöl Üniversitesi İnsan Arařtırmaları Etik Kurulu’nun 02.11.2021 tarih ve 25 sayılı kararı ile alınmıştır.

Declaration of Researchers' Contribution Rate

Since this study was prepared from a doctoral thesis, the 1st author is the thesis writer and the 2nd author is the thesis advisor.

Arařtırmacıların Katkı Oranı Beyanı

Bu çalışma doktora tezinden hazırlandığı için 1. yazar tez yazarı, 2. yazar tez danışmanıdır.

Declaration of Conflict

There is no potential conflict of interest in the study.

Çatışma Beyanı

Çalışmada herhangi bir potansiyel çıkar çatışması söz konusu değildir.

Note

This study is derived from the doctoral dissertation titled 'Reflections of the Digital Transformation Process in the Tourism Sector: A Research on the Use of Smart Tourism Technologies', conducted by Eda Hazarhun under the supervision of Prof. Dr. Özgür Devrim Yılmaz at the Institute of Social Sciences, Dokuz Eylöl University.

Not

Bu çalışma, Eda Hazarhun'un Prof. Dr. Özgür Devrim Yılmaz gözetiminde yürüttüğü 'Turizm Sektöründe Dijital Dönüşüm Sürecinin Yansımaları: Akıllı Turizm Teknolojilerinin Kullanımı Üzerine Bir Araştırma' başlıklı doktora tezinden üretilmiştir.

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TÜRKÇE GENİŞ ÖZET

Bu araştırmanın amacı turizm işletmelerinde (konaklama işletmeleri, seyahat acenteleri, yiyecek-içecek işletmeleri ve havayolları) çalışan ve yöneticilerin akıllı turizm teknolojilerinin kullanım düzeyinin ve deneyimlerinin keşfedilmesidir. Bu amaç doğrultusunda çalışmada nitel araştırma desenlerinden iç içe geçmiş çoklu durum deseni kullanılmıştır. Araştırmada durum olarak belirlenen; İstanbul'da yer alan iki konaklama işletmesi, iki yiyecek ve içecek işletmesi, iki seyahat acentesi ve iki havayolu işletmesinden maksimum çeşitlilik örnekleme yöntemi ile 48 çalışan ve yönetici ile yüz yüze yarı yapılandırılmış görüşmeler gerçekleştirilmiştir. Görüşmelerden elde edilen veriler, lisanslı Maxqda 2020 nitel veri analiz programından faydalanılarak içerik analizine tabi tutulmuştur. Araştırmanın güvenilirliğini sağlamak amacı ile nitel araştırmalarda bilgi sahibi olan, turizm alanında bir öğretim üyesinden katılımcılardan elde ettiği verileri kodlamasını istemiştir. Bu sayede araştırmacı kodlayıcılar arası uzlaşmayı sağlamayı amaçlamıştır. Araştırmacının isteğini kabul eden öğretim üyesi, ek kodlayıcı görevini üstlenmiştir. Araştırmacı tüm verileri ek kodlayıcıya göndermiştir. Ek kodlayıcı da tüm verileri araştırmacı gibi Maxqda 2020 nitel programından faydalanarak kodlamıştır. Kodlama sürecini tamamlayan iki araştırmacı, bir araya gelerek kodları karşılaştırmış ve farklı olan kodlar tespit edilmiştir. Bu farklı olan kodlar üzerine tartışmalar gerçekleştirerek uzlaşmaya varılmıştır. Uzlaşma sürecinde Miles & Huberman (1994)'ın önerdiği kod güvenilirlik kat sayısı hesaplanmıştır. Miles & Huberman (1994), araştırmacının kodları ile ek kodlayıcının oluşturduğu kodlar arasında en az %80 ve üzeri uyum olması gerektiğini vurgulamıştır. Buradan yola çıkarak araştırmacı aşağıda yer alan formülü kullanmıştır. Güvenirlik Kat Sayısı = Uzlaşılan Kod Sayısı/ Uzlaşılan kod sayısı + uzlaşılmayan kod sayısı Yapılan hesaplama sonucunda güvenilirlik katsayısının oranı %90 olarak hesaplanmıştır. Buradan elde edilen sonuca göre kodlayıcılar arası görüş birliğine varılarak araştırma güvenilir kılınmıştır. Araştırma sonuçlarına göre konaklama işletmelerinde, yiyecek ve içecek işletmelerinde ve seyahat acentelerinde karekod, dijital yazılımlar, sosyal medya, web sitesi, bulut teknolojileri, e-fatura, insan kaynakları yazılımları, e-muhasebe fişi uygulamaları, defter beyan sistemi, e-beyanname ve elektronik tebligat sistemini içeren çevrimiçi yazılımlar ve e-uygulamalar ve büyük veri gibi akıllı teknolojilerin kullanıldığı belirlenmiştir. Ayrıca havayolları işletmelerinde de kullanılan teknolojiler arasında kızılötesi iletişim, elektronik uçuş teknolojisi, sesli komut sistemi, wireless, küresel konum belirleme sistemi, sosyal medya, büyük veri, mobil uygulama, bulut teknolojisi, yapay zekâ, dijital kargo ve dijital self-service hizmet teknolojilerinin olduğu belirlenmiştir. Turizm işletmelerinde, ilerleyen yıllarda gelişmiş teknolojilerin kullanılacağı öngörülmektedir (Hazarhun & Yılmaz, 2021). Bu araştırmada da katılımcılar, Canton (2016)'ın belirttiği gibi gelecekte konaklama işletmelerinde hologram konserleri, DNA analizi ile otel ödeme işlemlerinin gerçekleştirilmesi, 3D yazıcılar, nörroteknoloji ile otel odalarında misafirlerin istediği rüyaları seçme fırsatlarını yakalayacağı vurgulanmaktadır. Yiyecek ve içecek işletmelerinde gelecekte ışınlanarak paket servisinin gerçekleştirileceği, DNA analizleri sonucu menülerin oluşacağı ve robotların çalıştığı restoranların olacağı sonucuna ulaşılmıştır. Dünyada, restoranlarda robot kullanımı yaygınlaşmasına rağmen (Kayran, 2021) İstanbul'da durum olarak seçilen iki restoranda da kullanılmadığı belirlenmiştir. Öte yandan, seyahat acentelerinde, gelecekte ışınlanma ve Metaverse teknolojileri, havayolları işletmelerinde de üç katlı uçaklar, elektrikli uçaklar, uçan taksiler, hipersonik uçaklar ve güneş enerjili uçakların kullanılacağı ön görülmektedir.

Bu çeşitli akıllı turizm teknolojileri, çalışanlar ve yöneticiler turizm işletmelerinde görevlerinin yerine getirilmesi için faydalı buldukları, kullanımının kolay olduğu, güvenilir buldukları, eğlenceli deneyim sağladığı ve iş yapış sürelerini kısalttığı ve performans arttırdığı için kullandıklarını vurgulamışlardır. Öte yandan araştırmacılar, akıllı turizm teknolojilerini kullanmaya kabul etse bile turizm işletmelerinde kullanımının önünde birtakım engeller olduğunu vurgulamışlardır. Bu engeller; konaklama işletmelerinin yapısının eski ve bu nedenle teknolojik alt yapının eksik olduğu, akıllı turizm teknolojilerini üreten yerel firmaların eksikliği, akıllı turizm teknolojilerinin yüksek maliyete sahip olması, işletmelerin robotlar yerine insana daha değer vermesi ve çalışanlar arasında değişime gösterilen direnç, doğru dijital strateji ve dönüşüm yol haritasını seçememek ve çalışanların güvenlik kaygılarının olduğu sonucuna varılmıştır. Turizm işletmelerinde Covid-19 pandemi sürecinde akıllı turizm teknolojilerinin kullanımının ve çalışanların bu teknolojilere karşı farkındalıklarının arttığı belirlenmiştir. Özellikle yiyecek ve içecek işletmelerinde Covid-19 pandemisinin, hayalet mutfak konseptini yaygınlaştırdığı, çevrim içi toplantıları arttırdığı ve stratejik kararların alınmasını yaygınlaştırdığı sonucuna varılmıştır. Seyahat acentelerinde Covid-19 pandemi süreci, seyahat acenteleri çalışanlarının daha çok teknolojiye ilgi gösterdiği ve çalışma biçimlerini değiştirdiği sonucuna ulaşılmıştır. Turizm işletmelerinde hem mevcut teknolojilerin yanında gelecekte kullanılması ön görülen teknolojilerin işletmelere fayda ve zararlı yönleri olduğu belirlenmiştir. Turizm işletmelerine marka imajının güçlendirmesi, misafir memnuniyetinin sağlanması, otellerin ürün ve hizmetlerini rakiplerine göre farklılaştırması, işletmelerin tanıtımlarını kolaylaştırarak ürün ve hizmet satışını kolaylaştırması, otel içinde tedarikçi ve misafirlerle kolay iletişim sergilemesi, misafirlerin bilgilerini depolanması ve maliyetlerin azalması yer almaktadır. Bu faydalar dışında katılımcılar; akıllı turizm teknolojileri sayesinde otellerde kâğıt kullanımının azaldığı, su ve enerji tasarrufu sağlandığı ve uçak kazalarının da azaldığı sonucuna da ulaşılmıştır. Akıllı turizm teknolojileri; yiyecek ve içecek işletmelerinin misafirlere hızlı hizmet, doğru sipariş teslimi, hijyen, sağlık ve mobil uygulamaların favori seçeneği sayesinde tekrar aynı yiyeceği seçme gibi çeşitli faydalar sağlamaktadır. Hızlı hizmet ve doğru sipariş teslimi bulgusu Atıcı & Ada (2017)'nin çalışmasının sonucu ile örtüşmektedir. Akıllı turizm teknolojilerinin turizm işletmelerinde çalışan ve misafirlere de faydalar sunmaktadır. Akıllı turizm teknolojileri konaklama işletmelerinde; çalışanların iş yükünün azalmasına, esnek çalışma koşullarına imkân sağlamasına, çalışanlar arasında bilgi akışının kolay olmasına, üretkenlik sağlamasına, zaman tasarrufunun olmasına ve farklı mesleklerin ortaya çıkmasına olanak sağlamaktadır. Ayrıca akıllı turizm teknolojileri seyahat acentesi çalışanlarının kişisel gelişimlerine ve uzaktan çalışma ile ailelerini daha çok ilgilenme fırsatları yakalamalarına imkân tanıdığı sonucuna ulaşılmıştır. Akıllı turizm teknolojilerinin turizm işletmelerine faydalarının yanı sıra zararları da vardır. Akıllı turizm işletmelerinin konaklama işletmelerine zararları misafirlerin gizli bilgilerini açığa çıkarması, teknolojilerin yüksek maliyetleri ve teknoloji konusunda uzman yüksek ücrete sahip personellerin istihdamına neden olması olarak belirlenmiştir. Yiyecek ve içecek işletmelerinde akıllı turizm teknolojileri, yemek tatlarını standart hale getirmesi, güvenlik sorunu ve benzer yemek tariflerinin hızla yaygınlaşmasını sağlamasından dolayı işletmelere zararlarının da olduğu belirlenmiştir. Ayrıca akıllı turizm teknolojileri geleneksel acentelerin sonunu getireceği de vurgulanmıştır. Havayolu işletmelerinde de dijital teknoloji kullanımının havayollarına zararları arasında diğer üç turizm işletmesinde de teknolojinin zararları arasında değerlendirilen veri güvenliği sorunu ve Mertcan (2020)'nin da altını çizdiği dijital göz yorgunluğu sendromu gelmektedir. Buna karşın akıllı turizm teknolojileri, dijital çağa ayak uyduramayan çalışanların işten ayrılmasına, çalışanlarda çeşitli sağlık sorunların meydana gelmesi, yaratıcılığın önüne ket vurulmasına, siber aylıklık, veri güvenliği sorunu, tükenmişlik sendromu ve çalışanın kontrol ve karar mekanizması süreçlerinin azalmasına, çalışanlar arasında sosyal iletişimin engellenmesi ve otomasyonun yaygınlaşarak istihdamın azalmasına da yol açacağı belirlenmiştir.