Jomat

Journal of multidisciplinary academic tourism
2022, 7 (1): 97-108
www.jomat.org

ISSN: 2645-9078

Perceptions about the applicability of robot technology in the tourism industry

Burçin Cevdet Çetinsöz, Seden Doğan, Alper Duran*

Keywords:
Tourism industry, Robot technology, Turkey

Article History:
Submitted: 06.09.2021
Revised: 09.12.2021
Accepted: 20.02.2022
Published Online: 21-02-2022

ABSTRACT

In the research, it is aimed to determine the applicability of robot technology and the importance of technological innovations in the tourism industry. The population of the research consists of academicians, managers and students in the tourism industry. In the research, the "convenience sampling" method was used, in which everyone who participated in the research could be included in the sample. All statements regarding the applicability of robot technology in the tourism industry and the importance of technological innovations in the tourism industry have been adapted from the relevant literature. The Cronbach Alpha test was applied for the reliability of the scale, along with the frequency distributions, percentiles, mean values, standard deviations and correlation coefficients from the descriptive statistics of the obtained data. In the research findings, it is accepted that airports, housekeeping activities, tour operator and travel agency services and hotel receptions are the most applicable areas of robot technology in the tourism industry.

Doi: https://doi.org/10.31822/jomat.2022-7-1-97

1. Introduction

Robots can be defined as *"mechanical objects developed to facilitate daily tasks and help people"*(Vatan & Doğan, 2021). There are numerous robots with varying characteristics that can be classified into two categories: stationary and mobile. Stationary robots are immobile and unable to move (Doğan & Vatan, 2019). Nowadays robotic applications are frequently being used in various activity areas such as the manufacturing industry (Attaran, 2007), house cleaning (Vaussard et al., 2014), medicine (Schommer et al., 2017), tourism (Papathanassis, 2017; Murphy, Hofacker, & Gretzel, 2017), agriculture (Driessen & Heutinck, 2015), the defense industry (Szegedi, et al., 2017) and elderly care (Glende et al., 2015; Beusher, et al., 2017). Service robots are currently perceived as technological products manufactured only by companies and sold to final customers (Ivanov & Webster, 2017). They are programmed to provide information and help people (Vatan & Dogan, 2021). Although as a concept, robots were first introduced by Karel Čapek in 1921. The term robot is derived from the Czech word *robota*. In 1921, the Czech author Karel Capek used the term in Rossum's Universal Robots. They started to be produced industrially for the first time in 1956 (Ivanov & Webster, 2019a).

With the Henn na Hotel which was the first hotel to work with robots in 2015, the tourism and travel industry has witnessed very rapid and important developments in artificial intelligence, robot technologies and service automation in recent years (Collins, Cobanoglu, Bilgihan, & Berezina, 2017; Ivanov, Webster, & Berezina, 2017; Murphy et al., 2017; Kayıkçı & Bozkurt, 2018; Ivanov & Webster, 2019a; Ivanov & Webster, 2020) to reduce costs, create memorable experiences, differentiate from competitors, establish and maintain a competitive advantage, and improve quality (Seyitoğlu & Ivanov, 2020). When we look at the examples of robotic applications in the fields of hospitality and tourism, Starwood's Aloft Hotel has commissioned a robotic butler, Boltr, to assist hotel guests, robotic arms have been manufactured for the

Corresponding Author* ***Research paper*

Burçin Cevdet Çetinsöz: *Prof. Dr., Alanya Alaaddin Keykubat University, Alanya, Turkey, Email: burcin.cetinsoz@alanya.edu.tr, Orcid Id: 0000-0003-1703-8067*

Seden Doğan : *Assoc. Prof., Samsun Ondokuz Mayıs University, Samsun, Turkey, Email: seden.dogan@omu.edu.tr, Orcid Id: 0000-0001-8547-7702*

Alper Duran: *Dr., Mersin University, Mersin, Turkey, Email: aduran@mersin.edu.tr, Orcid Id: 0000-0003-0420-03*

cruise industry to bartender at the Royal Caribbean's Bionic Bar, and Singapore has tested SARA, a robotic virtual agent to provide information and support to tourists in various subjects (Tung & Law, 2017).

In the early days of robotic technology, people (customers, managers, employees or the public) would either accept or resist robots which could vary from person to person (Ivanov et al., 2018b). The attitudes and perceptions of tourists (Ivanov & Webster, 2019a), young adults (Ivanov, Webster, & Garenko, 2018a) and tourism students (Tuominen & Ascenção, 2016) regarding the applicability of robot technology, which has been used in many areas of the tourism and travel industry have been investigated in literature. However, there is no comparable study on how industry representatives such as managers, academics and students evaluate or perceive the applicability of robot technology. The aim of this study is to determine the applicability of robot technology and the importance of technological innovations in the tourism industry.

Therefore, in line with this determined purpose, the current study was conducted to determine the opinions of managers, academicians and students, who are the main practitioners of the tourism industry, on the applicability of robot technology.

2. Literature Review

According to International Federation of Robotics, robots are defined as *"automatically controlled, reprogrammable, multipurpose manipulator, programmable in three or more axes, which can be either fixed in place or mobile for use in industrial automation applications"* (IFR, 2016).

According to Papathanassis (2017), the rationale for robot adoption is based on productivity, accessibility, and service enhancement. Industrial robots initially assist in the manufacturing process and increase productivity (Arai, Kato, & Fujita, 2010). When technology limitations can be overcome, the times for the extensive use of service robots are determined in any part of the hotel environment (Chin et al., 2014; Zalama et al., 2014). These types of limitations are related to the robotic control system's overall integration technology and standards (Chin et al., 2014; Zalama et al., 2014). The standardization might reduce robotics deployment costs while ensuring low liability, safety, and high development quality (Haidegger et al., 2013). Hotels might prefer to hire humanlike robot to have advantage in competition, as researchers have concluded that humanoid robots are better suited to jobs that require social interaction (Goetz, Kiesler, & Powers, 2003). The appearance and behavior of robots must also be balanced to ensure the acceptance (Mara & Appel, 2015). However, while robots' use appears to co-create positive service experiences with customers, the risks of service experiences being co-destructed must be accepted (Čaić, Odekerken-Schröder, & Mahr, 2018). Furthermore, because robotic technology in tourism and hospitality is still novel and limited (Papathanassis, 2017), it is critical to investigate potential customers' perspectives.

Hoteliers worldwide are now actively investigating how service robots can help their businesses to compete in highly competitive marketplace (Pinillos et al., 2016). We see an increasing number of service robots in tourism and hospitality operations (Ivanov, Webster, & Berezina, 2017). Hotels, restaurants, travel agencies, and theme parks, to name a few, have all adopted robots in the tourism and hospitality industries (Ivanov et al., 2017). These robots perform social and practical tasks such as serving customers and providing information and assistance to customers (Tung & Law, 2017). They can work as cooking chefs, room servers, room attendants, bellboy, waiters, bartenders, receptionists, and concierge staff (Seyitoğlu & Ivanov, 2021). Service robots are able to interact with the customers (Pinillos et al., 2016). Although other technologies like contactless payment, self-service kiosks, and touch screen panels can perform the same functional tasks as service robots, service robots can provide frontline services where interaction is an essential part of the customers' experiences (Lu et al., 2019). When service robots work as frontline employees, they are in charge of providing human-like services and interactions while also improving customer experiences in real-time (Kuo et al., 2017).

With a total of 186 robot workers, Henn-na Hotel is the first hotel where robots are employed. The front office has a humanoid robot as a receptionist (Henn-na Hotel, 2021). Three multi-lingual robots (one that is a dinosaur) welcome their guests, taking note of their names, various requests, and issues. In the luggage storage, a mechanism that incorporates robotic arms does the job (Papathanassis, 2017; Jarvis, 2016; Osawa et al., 2017: 219; Pierce, 2015). IBM's robot Connie operates at Hilton McLean Tysons Corner, Connie, named after the founder of the Hilton Hotel, is 60 cm tall in McLean, Virginia. Connie

provides information about the hotel and its surroundings (Ivanov, Webster, & Berezina, 2017; Trejos, 2016; Gagliordi, 2016). The Aloft Hotel in Cupertino, California has an automatic robot who handles tasks such as taking sheets, soap, towels, and linens to the room, and picks up dirty laundry. It is wearing an outfit and appears to have a name tag (Ivanov, et al., 2017; Trejos, 2014). The InterContinental Hotel Group employed a robot named Dash at the Crown Plaza San Jose in San Jose, California, in 2015. The Aloft has hired the butler Boltr to provide hospitality services. The Royal Caribbean has a team of robot bartenders (Kayıkçı & Bozkurt, 2018). Yotel transports 300 pieces of luggage a day with the ABB 6640 industrial robot which they call Yobot and help to facilitates fast and simple check-in (Social Tables, 2021). The Hotel EMC2 has two robots: Cleo and Leo. These two robots have approximately three feet in height and can be recharged. They deliver any forgotten items as well as bringing extra towels or food and other requested items to the rooms (Social Tables, 2021). On the other hand, Porter robots can handle complex transactions. They receive data from various sensors and other sources; they can learn from previous transactions and improve themselves over time (Pagallo, 2013; Buhalis et al., 2019). A burger robot named Flippy is able to perform up to 120 orders per hour. Cafe X employed robots baristas and they can prepare three beverages in 40 seconds (Tuomi, Tussyadiah, & Steinmetz, 2021). Briefly, it can be said that the robots might replace humans to perform dirty, dull, and dangerous (3D) tasks in a hospitality workplace (Ivanov, Seyitoğlu, & Markova, 2020) but not perform complex task like providing VIP service or dealing with complaints (Seyitoğlu & Ivanov, 2020).

The use of these robots in industries that require a lot of human interaction, such as hotels, restaurants, cruises, travel agencies, museums, and airports, is becoming more popular (Anandan, 2019). However, there are limited number academic studies on human-robot interaction in the hospitality industry (Chan & Tung, 2019; Kervenoael, Hasan, Schwob, & Goh, 2020). Consumer perceptions of robots in a service setting have been the focus of previous research in this area (Ho et al., 2020; Ivanov & Webster, 2019a; Ivanov & Webster, 2019b; Ivanov et al., 2018a; Ivanov et al., 2018b; Pinillos et al., 2016; Rodriguez-Lizundia et al., 2015; Tung & Au, 2018; Tussyadiah & Park, 2018; Tussyadiah et al., 2020). In a survey of 1003 people conducted by Ivanov and Webster (2019a), the participants agreed that service robots could work at the information desk and reservation office, as well as as a cleaner and cashier. In a survey of 260 Russian participants conducted in 2018a, Ivanov, Webster, and Garenko discovered that the participants believe robots can assist with baggage handling, towel/bed linen delivery, information submission, and payment processes. As seen and as Wirtz et al. (2018) expressed, existing literature on the proper workplace of robots in a hospitality establishment is still very limited.

Aims of Research

In the research, it is aimed to determine the applicability of robot technology and the importance of technological innovations in the tourism industry. Within the framework of the data obtained from the relevant literature, the research questions are as follows;

Research Question 1: In the research, the applicability of robot technology in the sub-sectors of the tourism industry was investigated.

Research Question 2: In the research, it was investigated whether technological innovations are important in the tourism industry.

3. Method

The population of the study consists of academicians, managers and students in the tourism industry. The research data was collected from tourism students, academicians and managers who participated in the Mersin University Faculty of Tourism Career Days and the IVth International Eastern Mediterranean Tourism Symposium held in 2019. A total of 1638 people attended the International Eastern Mediterranean Tourism Symposium. The "convenience sampling" method in which everyone participating in the study could be included in the sample was used (Altunışık, et al., 2005: 132). Sekaran (1992) and Altunışık et al. (2005:127) stated that a sample of 313 people could represent a population of 1638 people.

In this context, taking into account missing, erroneous and non-returned questionnaires, an application was carried out on 350 people and a total of 293 questionnaires were evaluated to be used for data collection.

The questionnaire, which was the data collection tool of the study, consisted of three parts. The first part included the individual characteristics of the participants (gender, age, education, occupation

and tourism experience) while the second part was divided into 6 sub-sectors of the tourism industry (hotel businesses, travel agencies and tourism information centers, events, car rental, transportation services and airports and other transportation) totaling 51 items for expressing opinions on the usability of robot technology.

In the second part, all statements regarding the usability of robot technology in the tourism industry were adapted from the studies of Ivanov, Webster and Garenko (2018a), while in the third part, 6 items on the importance of technological innovations in the tourism industry were adapted from the studies of Kazandjieva and Filipova (2018). In the research scale, the participation levels of the expressions regarding the use of robot technology in the sectors of the tourism industry are "StronglyDisagree=1…..StronglyAgree=5" and the participation levels of the expressions regarding the importance of technological innovations in the tourism industry are rated according to the 5 point Likert scale as "very unimportant=1…..very important=5".

Data Analysis Methods

The Cronbach Alpha test was applied to determine the reliability of the scale for the data obtained from the research results, in addition to the descriptive statistics of frequency distributions, percent rates, mean values, standard deviations and correlation coefficients.

The level of each item was calculated using the Bazazo, Elyas, Awawdeh, Faroun and Qawasmeh formulas (2017). (The highest score on the Likert scale - the lowest score on the Likert scale)/number of levels used = 5–1 / 5 = 0.80, hence 1–1.80 was "very low", 1.81–2.60 was "low" , 2.61–3.40 was "moderate", 3.41–4.20 was "high" and 4.21–5.00 was reflected as "very high". The SPSS 23.0 for Windows program was used in all analyzes used in the study.

Reliability

Cronbach's Alpha coefficients were calculated to test the reliability of the items in the study in terms of internal consistency. The Cronbach Alpha reliability analysis is an internal consistency analysis suitable for use in Likert type scales (Ercan & Kan, 2004:213) and it determines whether the statements in the measurement tool are consistent with each other. The reliability coefficient manifests values between 0 and 1, and the reliability increases as these values get closer to 1 (Ural & Kılıç, 2006). Cronbach's Alpha coefficient for "the participants' perceptions of the applicability of robot technology in hotel businesses" was determined as 0.94, the coefficient for "the participants' perceptions of the applicability of robot technology in travel agencies and tourism information centers" was 0.88, the coefficient for "the coefficient of participants' perceptions of the applicability of robot technology in events" was 0.85, the coefficient for "the participants' perceptions of the applicability of robot technology in car rental services" was 0.85, the coefficient for "the participants' perceptions of the applicability of robot technology in airlines/bus/train transportation" was 0.91, while the Cronbach's Alpha coefficient for "participants' perceptions of the applicability of robot technology at airports and other transportation stations" was 0.94, and the Cronbach's Alpha coefficient for "the importance of technology-related innovations in the tourism industry" scale was determined as 0.81.

4. Findings

The study sample consisted of 293 people. 56.7% of the participants in the study were men and 68% were between the ages of 18-30. 74.4% of the participants had a bachelor's degree and 19.5% had postgraduate education.

Table 1. Demographic and Professional Characteristics of the Participants

Gender	**N**	**%**
Male	166	56.7
Female	127	43.3
Age		
18-30 Age	199	68.0
31-40 Age	69	23.5
Age 41 and above	25	8.5
Occupation		
Manager in tourism business	85	29.0
Tourism academician	35	11.9
Tourism student	173	59.0
Education Level		
High school or less	8	2.7
2 year/associate degree	10	3.4
Bachelor	218	74.4
Postgraduate	57	19.5
Your Tourism Experience (Average number of hotel stays per year?)		
0	114	45.6
1-3 times	40	16.0
4-6 times	34	13.6
7 and above	62	24.8
Total	293	100

Source: *It was created by the authors*

Table 2. Perceptions of Participants on the Applicability of Robotic Technology in Hotel Businesses

Dimensions / Items	Mean	S.D.	Level	Cro. Alpha	Item-Total Corrl.
Applicability of Technology in Hotel Businesses in General	***3.11***	***1.38***	***M***	***0.94***	**-**
Reception	***3.26***	***1.40***	***M***	***0.86***	***1.000***
Check In Services	3.39	1.39	M		0.921
Check out Services	3.36	1.37	M		0.913
Guiding and escorting to the room	3.04	1.44	M		0.824
Housekeeping	***3.53***	***1.23***	***H***	***0.92***	***1.000***
Ironing services	3.66	1.17	H		0.861
Taking laundry orders (such as towels, sheets and ironing service)	3.58	1.25	H		0.914
In laundry services	3.56	1.20	H		0.910
Delivery of laundry orders (such as towels, sheets and ironing service)	3.51	1.24	H		0.842
In room cleaning	3.34	1.32	M		0.834
Restaurant	***3.06***	***1.36***	***M***	***0.93***	***1.000***
Cleaning the tables	3.45	1.30	H		0.653
Taking orders for room service	3.41	1.32	H		0.706
Providing information to the guests about the menu	3.22	1.36	M		0.767
Delivery of food and drinks in room service	3.11	1.35	M		0.826
Taking orders at the restaurant	3.11	1.37	M		0.850
Making/preparing drinks (coffee, tea, cocktail) in restaurant or bar	2.90	1.38	M		0.833
Serving/presenting drinks in a restaurant or bar	2.87	1.41	M		0.860
Escorting/guiding the guest to the table in the restaurant	2.85	1.34	M		0.833
Serving/presenting the food in the restaurant	2.84	1.43	M		0.874
Cooking/preparation	2.75	1.36	M		0.778
Additional Services	***2.61***	***1.55***	***M***	***0.83***	***1.000***
Giving very short (1-2 hours) training seminars to guests (Painting, landscape, gastronomy, etc. over)	2.85	1.36	M		0.642
Entertaining guests	2.83	1.33	M		0.780
Massage services	2.62	2.79	M		0.674
Dancing with the guests	2.59	1.38	L		0.838
Playing games with guests	2.55	1.36	L		0.769
Hairdressing services	2.45	1.31	L		0.762
Babysitting	2.35	1.35	L		0.818

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
Source: *It was created by the authors*

The study had three different target audiences. 29.0% were tourism business managers, 11.9% were tourism academicians and 59.0% were tourism students. 54.4% of the respondents had at least one hotel accommodation experience.

The participants were asked questions about the applicability of robot technology in an accommodation business. When evaluated on a departmental basis, the participants stated that robot technology could be used mostly in the housekeeping department ($\bar{x}$: 3.53) and at the reception ($\bar{x}$: 3.26). They indicated that robot technology could be used in housekeeping, namely "ironing services" ($\bar{x}$:3.66) and "laundry orders" ($\bar{x}$:3.58) and "laundry services" ($\bar{x}$:3.56). In the food and beverage department robot technology could be used for “cleaning tables” ($\bar{x}$: 3.45) and “room service ordering” ($\bar{x}$: 3.41), in reception for “check-in” ($\bar{x}$:3.39) and “check-out” ($\bar{x}$: 3.36) services. Participants did not think that robots could be used for additional services ($\bar{x}$:2.61) within the hotel.

Table 3. Perceptions of Tourism Managers, Academicians and Students towards the Applicability of Robotic Technology in Hotel Businesses

Categories / Profession Groups	N	Mean	S.D.	Level
Reception	***293***	***3.19***	***1.24***	***M***
Tourism Students	173	3.47	1.11	H
Tourism Academicians	35	3.25	1.19	M
Tourism Managers	85	2.85	1.40	M
Housekeeping	***293***	***3.53***	***1.08***	***H***
Tourism Academicians	36	3.80	0.95	H
Tourism Students	173	3.66	0.98	H
Tourism Managers	85	3.15	1.23	M
Restaurant	***293***	***3.00***	***1.06***	***M***
Tourism Students	173	3.24	1.02	M
Tourism Academicians	36	3.11	1.02	M
Tourism Managers	85	2.65	1.16	M
Additional services	***293***	***2.50***	***1.07***	***L***
Tourism Students	173	2.80	1.18	M
Tourism Academicians	36	2.44	0.92	L
Tourism Managers	85	2.28	1.13	L

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
Source: *It was created by the authors*

Table 4. Perceptions of Participants on the Applicability of Robotic Technology in Travel Agencies and Tourism Information Centers

Dimentions / Items	Mean	S.D.	S.L.	Cro. Alpha	Item-Total Corrl.
Travel Agencies / Tourism Information Center	***3.23***	***1.36***	***M***	***0.88***	***1.000***
Providing information regarding the questions of the guests (in the office)	3.34	1.29	M		0.835
Guiding museums and ruins	3.20	1.41	M		0.924
Guiding city tours (City Sightseeing Tours)	3.13	1.38	M		0.941

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
Source: *It was created by the authors*

In Table 3, the evaluations of the participants have been classified according to their occupational groups. Tourism academics ($\bar{x}$:3.80) and students ($\bar{x}$:3.66) stated that robot technology could be used mostly in housekeeping, while tourism students thought that robots could be benefited from in reception ($\bar{x}$:3.47) and the food and beverage department ($\bar{x}$:3.24).

The usability of robot technology in travel agencies / tourism information centers is asked in Table 4. Participants stated that robots could provide "information in the office" ($\bar{x}$:3.23), "guidance for museums and archeological sites" ($\bar{x}$:3.20) and city tours ($\bar{x}$:3.13).

Table 5. Perceptions of Tourism Managers, Academicians and Students towards the Applicability of Robotics in Travel Agencies and Tourism Information Centers

Categories / Profession Groups	N	Mean	S.D.	Level
Travel Agencies / Tourism Information Center	***293***	***3.35***	***1.23***	***M***
Tourism Students	173	3.47	1.19	H
Tourism Managers	85	3.34	1.22	M
Tourism Academicians	35	3.25	1.30	M

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
Source: *It was created by the authors*

Table 5 displays the evaluations of the participants according to occupational groups which reveals that tourism students ($\bar{x}$:3.47), tourism managers ($\bar{x}$:3.34) and tourism academicians ($\bar{x}$:3.25) stated that robot technology could be used in travel agencies / tourism information centers.

Table 6. Perceptions of Participants on the Applicability of Robotic Technology in Events

Dimentions / Items	Mean	S.D.	S.L.	Cro. Alpha	Item-Total Corrl.
Events	***3.17***	***1.31***	***M***	***0.85***	***1.000***
Providing information about the event program	3.57	1.20	H		0.704
Guiding guests to their seats	3.21	1.33	M		0.872
Providing show and entertainment services to guests	3.00	1.36	M		0.875
Serving food and beverage during the event	2.91	1.36	M		0.873

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
Source: *It was created by the authors*

The participants are asked questions about the use of robot technology in tourism activities in Table 6. The participants stated that robot technology could be used mostly in services such as "informing about event programs" ($\bar{x}$: 3.57) and "guiding to seats" ($\bar{x}$:3.21).

Table 7. Perceptions of Tourism Managers, Academicians and Students towards the Applicability of Robotic Technology in Events

Categories / Profession Groups	N	Mean	S.D.	Level
Events	***293***	***3.15***	***1.05***	***M***
Tourism Students	173	3.30	1.09	M
Tourism Academicians	35	3.30	0.98	M
Tourism Managers	85	2.86	1.09	M

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
Source: *It was created by the authors*

In Table 7, tourism students ($\bar{x}$:3.30) and academicians ($\bar{x}$:3.30) state that robots could be used in tourism activities, while tourism managers ($\bar{x}$:2.86) do not this feasible.

Table 8. Perceptions of Participants on the Applicability of Robotic Technology in Car Rental Services

Dimentions / Items	Mean	S.D.	S.L.	Cro. Alpha	Item-Total Corrl.
Car Rental Services	***3.21***	***1.35***	***M***	***0.85***	***1.000***
In the cleaning of vehicles	3.54	1.28	H		0.740
Automatically going to the charging/petrol station when the gas tank or electricity charge limit falls below a certain limit	3.46	1.35	H		0.822
Unlocking and using the vehicle automatically with the reservation code received	3.33	1.35	M		0.862
In turnkey delivery service of vehicles with robotic vehicles	3.11	1.40	M		0.798
To drive a vehicle	2.59	1.41	M		0.765

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
Source: *It was created by the authors*

The evaluation of robot technology in car rental services is studied in Table 8. While the participants stated that robots could be used in car rental operations in general ($\bar{x}$:3.21), they stated that robots could not be used for chauffeuring services ($\bar{x}$:2.59).

Table 9. Perceptions of Tourism Managers, Academicians and Students towards the Applicability of Robotic Technology in Car Rental Services

Categories/ Profession Groups	N	M.	S.D.	Level
Car Rental Services	***293***	***3.22***	***1.04***	***M***
Tourism Academicians	35	3.45	0.88	H
Tourism Students	173	3.31	1.08	M
Tourism Managers	85	2.91	1.16	M

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
***Source**: It was created by the authors*

In Table 9, tourism academicians ($\bar{x}$:3.45) and students ($\bar{x}$:3.31) stated that robots could be used in car rental services, while tourism managers approached robot technology in this subject negatively.

Table 10. Perceptions of Participants on the Applicability of Robotic Technology in Airline/Bus/Train Transport

Dimentions / Items	M	S.D.	S.L.	Cro. Alpha	Item-Total Corrl.
Airlines/Bus/Train Transportation	***3.08***	***1.38***	***M***	***0.91***	***1.000***
Cleaning services of transportation vehicle	3.59	1.28	H		0.632
Providing information about the tour/flight/road route	3.58	1.29	H		0.746
Providing information about the vehicle of transport	3.55	1.28	H		0.747
Providing information on travel, safety and security procedures	3.53	1.30	H		0.746
Check-In Services (like airports)	3.38	1.43	M		0.750
Serving food and beverage during the travel	3.06	1.40	M		0.664
Guiding to the passenger seat	3.00	1.43	M		0.680
Use of trains by robots	2.69	1.49	M		0.795
Use of marine vehicles by robots (like Ships, Cruisers)	2.55	1.44	L		0.777
Use of buses by robots	2.51	1.44	L		0.777
Use of airplanes by robots	2.50	1.42	L		0.719

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
***Source:** It was created by the authors*

In Table 10, the participants stated that robot technology could generally be used in transportation services in tourism ($\bar{x}$:3.08). The participants indicated that robot technology could be used the most in subjects such as "cleaning" ($\bar{x}$:3.59), "information about road routes" ($\bar{x}$:3.58), "information about the means of transportation" ($\bar{x}$:3.55) and "traveling, safety and security procedures". They stated that robot technology can be used in the subjects of "providing information" ($\bar{x}$: 3.53). The participants reacted negatively to the use of transportation vehicles by robots.

Table 11. Perceptions of Tourism Managers, Academicians and Students towards the Applicability of Robotic Technology in Airline/Bus/Train Transportation

Categories/ Profession Groups	N	Mean	S.D.	Level
Airlines/Bus/Train Transportation	*293*	*3.08*	*0.99*	*M*
Tourism Academicians	35	3.27	0.89	M
Tourism Students	173	3.17	0.96	M
Tourism Managers	85	2.83	1.12	M

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
***Source:** It was created by the authors*

In Table 11, tourism academicians ($\bar{x}$:3.27) and students ($\bar{x}$:3.17) stated that robot technology could be used in transportation services, while tourism managers ($\bar{x}$:2.83) did not agree.

Table 12. Participants' Perceptions of the Applicability of Robot Technology at Airports and Other Transportation Stations

Dimentions / Items	Mean	S.D.	Cro. Alph.	Item-Total Corrl.	Level
Airports & Other Transport Stations	***3.82***	***1.18***	***0.94***	***1.000***	***H***
Providing information about ticket prices	3.89	1.13		0.931	H
Provide information on available passenger seats for sale	3.84	1.17		0.946	H
Providing information about the arrival and departure of transport vehicles	3.79	1.19		0.921	H
Providing information on special legal regulations and visa formalities on travels	3.76	1.23		0.899	H

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
***Source:** It was created by the authors*

In Table 12, participants indicated that robot technology could be benefited from to show "ticket prices" ($\bar{x}$:3.89), "saleable available passenger seats" ($\bar{x}$:3.84), "arrival and departure times of transportation vehicles" ($\bar{x}$: 3.79) and provide information about "legal regulations and visa formalities" ($\bar{x}$:3.76).

Table 13. Tourism Managers, Academicians and Students' Perceptions of the Applicability of Robot Technology in Airports and Other Transportation Stations

Category / Profession Groups	N	Mean	S.D.	Level
Airlines/Bus/Train Transport	***293***	***3.89***	***0.99***	***H***
Tourism Academicians	35	4.20	0.69	H
Tourism Students	173	3.83	1.07	H
Tourism Managers	85	3.64	1.22	H

Order Scale: 1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
***Source:** It was created by the authors*

In Table 13, tourism academicians ($\bar{x}$:4.20), students ($\bar{x}$:3.83) and tourism managers ($\bar{x}$:3.64) expressed a high level of positivity about using robot technology in airports and other transportation stations in general.

Table 14. The Importance of Technology-Related Innovations in the Tourism Industry

Items	Mean	S.D.	Cro. Alpha	Item-Total Corrl.	Level
Tourism Industry	***4.12***	***0.92***	***0.81***	***1.000***	***H***
Transportation Sector	4.37	0.84		0.589	VH
Accomodation Sector	4.27	0.79		0.771	VH
Tour Operator and Travel Agency Sector	4.24	0.81		0.724	VH
Tour Guiding Sector	4.00	0.97		0.777	H
Food & Beverage Sector	3.96	1.00		0.757	H
Animation and Entertainment Services Sector	3.91	1.15		0.715	H

Order Scale:1–1.80 very low;1.81–2.60 low;2.61–3.40 moderate; 3.41–4.20 high;4.21–5 very high.
Source: It was created by the authors

Finally, in Table 14, the participants were asked about the importance of using technology in the sub-sectors of the tourism industry. In general, participants ($\bar{x}$:4,12) stated that the use of technological innovations is important in all sub-sectors.

5. Conclusion and Recommendations

The aim of the study was to determine the applicability of robot technology and the importance of technological innovations in the tourism industry. Therefore, questions were asked to this end in the study to determine the applicability of robot technology in the sub-sectors of the tourism industry and the importance of technological innovations in the tourism industry. The findings of the study also reveal the attitudes and perceptions of managers, academicians and students, who are the main dynamics of the tourism industry, towards artificial intelligence and robot applications.

In the future, the effectiveness of artificial intelligence applications and robot technologies will increase, they will penetrate many areas, they will appear often in our living spaces and in the business world and they will become a part of our daily and business life (Atsız, 2021; Kayıkçı & Bozkurt, 2018). The results of the study indicate that technological innovations in the tourism industry are very important especially in the transportation, accommodation and tour operator and travel agency sectors. In their study on consumers' perceptions of technological innovations in tourism, Kazandjieva and Filipova (2018) stated that the majority of consumers considered technological innovations most important in the transportation sector in the tourism and travel industry. Ever since the 1950s, developments in transportation technology in the world have shortened distances and created more comfortable and cost-effective transportation models (Baykal, 2015). In addition, another finding of Kazandjieva and Filipova (2018) emphasizes the importance of technological innovations in the tour operators and travel agencies sector, and this is commensurate with the results of the current study. Kayıkçı and Bozkurt (2018) assert that robots, artificial intelligence and automation in travel, tourism and accommodation areas will cause great changes in the sector. Airports, housekeeping activities, tour operator and travel agency services, and hotel receptions are considered to be the most suitable areas for robot applications in tourism. In their study, Ivanova and Webster (2019ab) stated that robots can be utilized in service areas in the travel and tourism industry such as providing information, housekeeping activities and processing reservations, payments and documents. This shows that compared to humans, robots can make fewer errors in the specified service areas.

The findings of the current study show the application areas that the tourism industry perceives as the most suitable for robotization from a managerial perspective. In fact, these application areas are those that can be accepted most quickly and easily by the tourism industry. Robot technology can be implemented rapidly in these acceptable service areas of the tourism industry. Advances in robotics and artificial intelligence, the increasing capabilities of robots, and decreasing purchase and maintenance costs will make robots an alternative to human labor in the tourism industry (Ivanov, Webster, & Berezina, 2017). Robots can provide functional speed and convenience for businesses, provide significant savings in costs and reduce human-induced errors to zero in tourism, which is a labor-intensive industry (Kozak, et al., 2008, p. 40). In the tourism and travel industry, where competition is intense, it is necessary to pursue and apply these developments in robot technology.

Robotic technology has started to take its place rapidly in the tourism and travel industry, and it is therefore recommended that courses covering the usage areas of robots and robotic software / coding is added to the education curricula in tourism education institutions in the coming years. Furthermore, the effects on facility design and financial profitability should be researched by academics and transferred to the industry to establish a suitable working environment for robots. In fact, according to Touretzky (2010), students should be encouraged to watch and

participate in robot competitions (such as cocktail competitions). Joint studies can be carried out by cooperating with different disciplines from the field of tourism, such as software and computer engineering. Murphy et al. (2017) suggest that educators should organize debates among students in which areas and why robot technology will be used in their lessons, organize essay competitions, and conduct studies on how robots will affect tourism and travel investments, income, expenses and profits.

References

Altunışık, R., Coşkun, R., Bayraktaroğlu, S., & Yıldırım, E. (2005). *Sosyal bilimlerde araştırma yöntemleri*. İstanbul: Sakarya Kitabevi.

Anandan, T. M. (2019). Human-Robot Interaction: A Team Sport. Accessed at. https://www.automate.org/industry-insights/human-robot-interaction-a-team-sport, (21.07.2021).

Arai, T., Kato, R., & Fujita, M. (2010). Assessment of operator stress induced by robot collaboration in assembly. *CIRP Annals - Manufacturing Technology*, 59, 5-8. https://doi.org/10.1016/j.cirp.2010.03.043

Atsız, O. (2021). Virtual reality technology and physical distancing: A review on limiting human interaction in tourism. *Journal of Multidisciplinary Academic Tourism*, 6 (1), 27-35. DOI: 10.31822/jomat.834448

Attaran, M. (2007). Robotics Applications in Manufacturing. *Journal of Information Systems Management*, 7 (1), 14-21. https://doi.org/10.1080/07399019008968323

Baykal, F. (2015). Uluslararası Turizm Ulaştırmasının Akış Yönü ve Dağılış Dokusu. *Ege Coğrafya Dergisi*, 24 (2), 57-68.

Bazazo, I., Elyas, T., Awawdeh, L., Faroun, M., & Qawasmeh, S. (2017). The impact of Islamic attributes of destination loyalty via the mediating effect of tourist satisfaction. *International Journal of Business Administration*, 8(4), 65–78.

Beusher, L. M., Fan, J., Sarkar, N., Dietrich, M. S., Newhouse, P. A., Miller, K. F., Mion, L. C. (2017). Socially assistive robots: measuring older adults' perceptions. *Journal of Gerontological Nursing*, *43(12),* 35-43. https://doi.org/10.3928/00989134-20170707-04

Buhalis, D., Harwood, T., Bogicevic, V., Viglia, G., Beldona, S., & Hofacker, C. (2019). Technological disruptions in services: Lessons from tourism and hospitality. *Journal of Service Management*, 30(4), 484–506. https://doi.org/10.1108/JOSM-12-2018-0398

Čaić, M., Odekerken-Schröder, G., & Mahr, D. (2018). Service robots: value co-creation and co-destruction in elderly care networks. *Journal of Service Management*, 29 (2),178-205. https://doi.org/10.1108/JOSM-07-2017-0179

Chan, A. P. H., & Tung, V. W. S. (2019). Examining the effects of robotic service on brand experience: the moderating role of hotel segment. *Journal of Travel & Tourism Marketing*, 36 (4), 458-468. https://doi.org/10.1080/10548408.2019.1568953

Chin, Y. H., Lee, H. P., Su, C. W., Li, J. H., Lin, C. H., & Wang, J. F. (2014). A Framework Design for Human-Robot Interaction. In: Huang Y M., Chao H C., Deng D J., Park J. (eds) Advanced Technologies, Embedded and Multimedia for Human-centric Computing. Lecture Notes in Electrical Engineering, vol 260. Springer, Dordrecht. https://doi.org/10.1007/978-94-007-7262-5_118

Collins, G. R., Cobanoglu, C., Bilgihan, A., & Berezina, K. (2017). *Hospitality information technology: Learning how to use it* (8th ed.). *Automation and Robotics in the Hospitality Industry,* Dubuque, IA: Kendall/Hunt Publishing Co.

Doğan, S., & Vatan, A. (2019). Hotel managers' thoughts towards new technologies and service robots at hotels: A qualitative study in Turkey. In C. Cobanoglu, M. Cavusoglu, K. Corbacı (eds), *Advances in Global Business and Economics 2,* 382-300. Anahei Publishing.

Driessen, C., & Heutinck, L. F. M. (2015). Cows desiring to be milked? Milking robots and the co-evolution of ethics and technology on Dutch dairy farms. *Agriculture and Human Values*, 32(1), 3-20.

Ercan, İ., & Kan, İ. (2004). Ölçeklerde güvenirlik ve geçerlik. *Uludağ Üniversitesi Tıp Fakültesi Dergisi*, 30 (3), 211-216.

Gagliordi, N. (2016). This Watson-Powered Robot Concierge is Rethinking the Hotel Industry. Accessed at. https://www.zdnet.com/article/this-watson-powered-robot-concierge-is-rethinking-the-hotel-industry/, (28.07.2021).

Glende, S., Conrad, I., Krezdorn, L., Klemcke, S., & Krätzel, C. (2015). Increasing the acceptance of assistive robots for older people through marketing strategies based on stakeholder needs. *International Journal of Social Robotics*, 8(3), 1-15.

Goetz, J., Kiesler, S., & Powers, A. (2003). Matching robot appearance and behavior to tasks to improve human-robot cooperation. The 12th IEEE International Workshop on Robot and Human Interactive Communication, , Oct. 31 - Nov. 2, 2003. California. USA, 55-60. https://doi.org/10.1109/ROMAN.2003.1251796

Haidegger, T., Barreto, M., Gonçalves, P., Habib, M. K., Ragavan, S. K. V., Li, H., Vaccarellah, A., Perroneh, R., & Prestesi, E. (2013). Applied ontologies and standards for service robots. *Robotics and Autonomous Systems,* 61 (11), 1215–1223. https://doi.org/10.1016/j.robot.2013.05.008.

Henn na Hotel. (2021). Henn na Hotel General Concept. Accessed at. https://www.h-n-h.jp/en/concept, (01.07.2021).

Ho, T. H., Tojib, D., & Tsarenko, Y. (2020). Human staff vs. service robot vs. fellow customer: Does it matter who helps your customer following a service failure incident?. *International Journal of Hospitality Management*, 87, 1-10. https://doi.org/10.1016/j.ijhm.2020.102501

IFR. (2016). Service Robots. http://www.ifr.org/service-robots/

Ivanov, S., & Webster, C. (2017). The robot as a consumer: a research agenda. Paper presented at the "Marketing: experience and perspectives" Conference, 29-30 June 2017, University of Economics-Varna, Bulgaria.

Ivanov, S., & Webster, C. (2019a). Perceived appropriateness and intention to use service robots in tourism. In Pesonen, J. & Neidhardt, J. (Eds.) Information and Communication Technologies in Tourism 2019, Proceedings of the International Conference in Nicosia, Cyprus, 30.01-01.02.2019, 237-248.

Ivanov, S., & Webster, C. (2019b). Economic Fundamentals of the Use of Robots, Artificial Intelligence, and Service Automation in Travel, Tourism, and Hospitality. Ivanov, S. and Webster, C. (Ed.) Robots, Artificial Intelligence, and Service Automation in Travel, Tourism and Hospitality, Emerald Publishing Limited, Bingley, 39-55. https://doi.org/10.1108/978-1-78756-687-320191002

Ivanov, S., & Webster, C. (2020). Robots in tourism: a research agenda for tourism economics. *Tourism Economics (forthcoming)*. https://doi.org/10.1177/1354816619879583

Ivanov, S., Seyitoğlu, F., & Markova, M. (2020). Hotel managers' perceptions towards the use of robots: A mixed-methods approach. *Information Technology & Tourism*, 22 (4), 505-535.

Ivanov, S., Webster, C., & Berezina, K. (2017). Adoption of robots and service automation by tourism and hospitality companies. *Revista Turismo & Desenvolvimento*, 27/28, 1501-1521.

Ivanov, S., Webster, C., & Garenko, A. (2018a). Young Russian adults' attitudes towards the potential use of robots in hotels. *Technology in Society,* 55, 24–32.

Ivanov, S., Webster, C., & Seyyedi, P. (2018b). Consumers' attitudes towards the introduction of robots in accommodation establishments. *Tourism*, 66 (3), 302-317.

Jarvis, H. (2016). Robot-Run Hotel gets Guinness approval. Accessed at. https://standbynordic.com/robot-run-hotel-gets-guinness-approval/ (02.06.2021)

Kayıkçı, M. Y., & Bozkurt, A. K. (2018). Dijital çağda z ve alpha kuşağı, yapay zeka uygulamaları ve turizme yansımaları. *Sosyal Bilimler Metinleri*, 01, 54-64.

Kazandjieva, V. I., & Filipova, H. P. (2018). Customer's perception assessment of tech-related innovations in tourism. *Izvestiya Journal of Varna University of Economics*, 62 (1), 5-20.

Kervenoael, R., Hasan, R., Schwob, A., & Goh, E. (2020). Leveraging human-robot interaction in hospitality services: Incorporating the role of perceived value, empathy, and information sharing into visitors' intentions to use social robots. *Tourism Management,* 78, 1040-1042. https://doi.org/10.1016/j.tourman.2019.104042

Kozak, N., Kozak, M. A., & Kozak, M. (2008). *Genel Turizm İlkeler-Kavramlar*. Ankara: Detay Yayıncılık.

Kuo, C. M., Chen, L. C., & Tseng, C. Y. (2017). Investigating an innovative service with hospitality robots. *International Journal of Contemporary Hospitality Management*, 29 (5), 1305-1321. https://doi.org/10.1108/IJCHM-08-2015-0414

Lu, L., Cai, R., & Gursoy, D. (2019). Service robots: Value co-creation and co-destruction in elderly care networks. *International Journal of Hospitality Management*, 80, 36-51. https://doi.org/10.1016/j.ijhm.2019.01.005

Mara, M., & Appel, M. (2015). Science fiction reduces the eeriness of android robots: A field experiment. *Computers in Human Behavior*, 48, 156-162. https://doi.org/10.1016/j.chb.2015.01.007

Murphy, J., Hofacker, C., & Gretzel, U. (2017). Dawning of the Age of Robots in Hospitality and Tourism: Challenges for Teaching and Research. *European Journal of Tourism Research*, 11, 104-111.

Osawa, H., Ema, A., Hattori, H., Akiya, N., Kanzaki, N., Kubo, A., Koyama, T., & Ichise, R. (2017). What is real risk and benefit on work with robots?: From the analysis of a robot hotel. Proceedings of the Companion of the 2017 ACM/IEEE International Conference on Human-Robot Interaction, 241–242. 6–9 March, Vienna, Austria. https://doi.org/10.1145/3029798.3038312

Pagallo, U. (2013). Robots in the cloud with privacy: A new threat todata protection?. *Computer Law & Security Review*, 29 (5), 501-508.

Papathanassis, A. (2017). R-Tourism: Introducing the Potential Impact of Robotics and Service Automation in Tourism. *"Ovidius" University Annals, Economic Sciences Series*, XVII (1), 211-216.

Pierce, A. (2015). A Hotel Staffed by Robots. Accessed at. http://www.technologytoday.us/columnPDF/A_Hotel_Staffed_by_Robots.pdf (11.06.2021).

Pinillos, R., Marcos, S., Feliz, R., Zalama, E., & Gómez-García-Bermejo, J. (2016). Long-term assessment of a service robot in a hotel environment. *Robotics and Autonomous Systems*, 79, 40-57. https://doi.org/10.1016/j.robot.2016.01.014

Rodriguez-Lizundia, E., Marcos, S., Zalama, Z., Gómez-García-Bermejo, J., & Gordaliza, A. (2015). A bellboy robot: Study of the effects of robot behaviour on userengagement and comfort. *International Journal of Human-Computer Studies*, 82, 83-95. https://doi.org/10.1016/j.ijhcs.2015.06.001

Schommer, E., Patel, V. R., Mouraviev, V., Thomas, C., & Thiel, D. D. (2017). Diffusion of robotic technology into urologic practice has led to improved resident physician robotic skills. *Journal of Surgical Education*, 74(1), 55-60.

Sekaran, U. (1992). *Research methods for business: A skill building approach*. John Wiley & Sons.

Seyitoğlu, F., & Ivanov, S. (2020). A conceptual framework of the service delivery system design for hospitality firms in the (post-) viral world: The role of service robots. *International Journal of Hospitality Management,* 91, 102661. https://doi.org/10.1016/j.ijhm.2020.102661

Seyitoğlu, F., & Ivanov, S. (2021). Service robots as a tool for physical distancing in tourism. *Current Issues in Tourism,* 24 (12), 1631-1634. https://doi.org/10.1080/13683500.2020.1774518

Szegedi, P., Koronváry, P., & Békési, B. (2017). The use of robots in military operations. *Scientific Research And Education in The Air Force*, 1, 221-230.

Social Tables (2021). Robots in Hotels: 6 Hotel Brands Leading the Way. Accessed at. https://www.socialtables.com/blog/hospitality-technology/hotel-brands-robot/, (17.07.2021).

Touretzky, D. S. (2010). Preparing Computer Science Students for the Robotics Revolution. *Communications of the ACM*, 53 (8), 27-29. https://doi.org/10.1145/1787234.1787244

Trejos, N. (2014). Ready for the Hotel Industry's First Robotic Butler?. Accessed at. https://www.usatoday.com/story/travel/hotels/2014/08/12/aloft-hotels-starwood-robotic-bultler/13954231/, (28.07.2021).

Trejos, N. (2016). Introducing Connie, Hilton's New Robot Concierge. Accessed at. https://www.usatoday.com/story/travel/roadwarriorvoices/2016/03/09/introducing-connie-hiltons-new-robotconcierge/81525924/, (28.07.2021).

Tung, V. W. S., & Au, N. (2018). Exploring customer experiences with robotics in hospitality. *International Journal of Contemporary Hospitality Management*, 30 (7), 2680–2697. https://doi.org/10.1108/IJCHM-06-2017-0322

Tung, V. W. S., & Law, R. (2017). The potential for tourism and hospitality experience research in human-robot interactions. *International Journal of Contemporary Hospitality Management*, 29 (10), 2498-2513. https://doi.org/10.1108/IJCHM-09-2016-0520

Tuomi, A., Tussyadiah, I., & Steinmetz, J. (2021). Applications and implications of service robots in hospitality. *Cornell Hospitality Quarterly,* 62 (2), 232-247. https://doi.org/10.1177/1938965520923961

Tuominen, P. P., & Ascenção, M. P. (2016). The hotel of tomorrow: A service design approach. *Journal of Vacation Marketing*, 22 (3), 279-292.

Tussyadiah, I. P., & Park, S. (2018). Consumer evaluation of hotel service robots. In Stangl, B., & Pesonen, J. (Eds.), Information and Communication Technologies in Tourism 2018 (pp. 308-320). Springer. DOI: 10.1007/978-3-319-72923-7_24

Tussyadiah, I. P., Zach, F. J., Wang, J.(2020). Do travelers trust intelligent service robots?. *Annals of Tourism Research*, 81, 1-14. https://doi.org/10.1016/j.annals.2020.102886

Ural, A., & Kılıç, İ. (2006). *Bilimsel Araştırma Süreci ve SPSS ile Veri Analizi*. Ankara: Detay Yayıncılık.

Vatan, A., & Doğan, S. (2021). What do Hotel Employees Think About Service Robots? A Qualitative Study in Turkey. *Tourism Management Perspectives,* 37, 100775. https://doi.org/10.1016/j.tmp.2020.100775

Vaussard, F. C., Fink, J., Bauwens, V., Rétornaz, P., Hamel, D., Dillenbourgh, P., & Mondada, F. (2014). Lessons Learned from Robotic Vacuum Cleaners Entering in the Home Ecosystem. *Robotics and Autonomous Systems*, 62 (3), 376-391.

Wirtz, J., Patterson, P. G., Kunz, W. H., Gruber, T., Lu, V. N., Paluch, S., & Martins, A. (2018). Brave new world: service robots in the frontline. *Journal of Service Management*, 29 (5), 907-931. https://doi.org/10.1108/JOSM-04-2018-0119

Zalama, E., Garcia-Bermego, J. G., Marcos, S., Dominguez, S., Feliz, R., Pinillos, R., & Lopez, J. (2014). *Sacarino, a Service Robot in a Hotel Environment*. In: Armada M., Sanfeliu A., Ferre M. (eds) ROBOT2013: First Iberian Robotics Conference. Advances in Intelligent Systems and Computing, 253, 3-14. https://doi.org/10.1007/978-3-319-03653-3_1, 3-14

Jomat

Journal of multidisciplinary academic tourism

2022, 7 (1): 97-108

https://doi.org/10.31822/jomat.2022-7-1-97

ISSN: 2645-9078

INFO PAGE

Perceptions about the applicability of robot technology in the tourism industry

Abstract

In the research, it is aimed to determine the applicability of robot technology and the importance of technological innovations in the tourism industry. The populatin of the research consists of academicians, managers and students in the tourism industry. In the research, the "convenience sampling" method was used, in which everyone who participated in the research could be included in the sample. While all statements regarding the applicability of robot technology in the tourism industry are adapted from the work of Ivanov, et al., (2018), statements on the importance of technological innovations in the tourism industry are adapted from the studies of Kazandjieva and Filipova (2018). The Cronbach Alpha test was applied for the reliability of the scale, along with the frequency distributions, percentiles, mean values, standard deviations and correlation coefficients from the descriptive statistics of the obtained data. In the research findings, it is accepted that airports, housekeeping activities, tour operator and travel agency services and hotel receptions are the most applicable areas of robot technology in the tourism industry.

Keywords: *Tourism Industry, Robot Technology, Turkey*

Authors

Full Name	Author contribution roles	Contribution rate
Burçin Cevdet Çetinsöz:	*Conceptualization, Methodology, Writing - Original Draft, Writing - Review & Editing, Project administration,*	*40%*
Seden Doğan :	*Conceptualization, Methodology, Writing - Original Draft, Writing - Review & Editing,*	*30%*
Alper Duran:	*Conceptualization, Methodology, Writing - Original Draft, Writing - Review & Editing,*	*30%*

Author statement: *Author(s) declare(s) that All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.* ***Declaration of Conflicting Interests:*** *The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article*

This paper does not required ethics committee report

Justification: This research was conducted before January 1, 2020. For this reason, it is exempt from "ULAKBIM TRDizin" criterion.