Tourist behavior after service robots

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ABSTRACT

This is a conceptual review paper explains and discusses the role and potential of service robots in tourism and hospitality from the perspective of consumer behavior. The adoption and use of robots have increased rapidly in tourism and hospitality over the past few years due to a number of reasons. With the developments in digital technology and artificial intelligence, the use of robots has become cheaper and easier for businesses in various industries including tourism. Moreover, the developments such as the Covid-19 pandemic accelerated the adoption of robots in tourism and hospitality where interaction with the customer is frequent and intense. In line with the growth of the adoption and the use of service robots in the industry, there is a growing body of research in the field. The future potential of service robots and their adoption by businesses depend very much on a better understanding of service robots. This review study explores attitudes and expectations of consumers regarding the use of service robots at hotels.

1. Introduction

The rapid development of technology and providing benefits in many areas have made it necessary for people to keep up with technological developments. Technology enables the same service to reach people faster, at lower cost and with less effort (Koc & Ayyildiz, 2021). Service robots are one of the technologies that benefit people and are becoming increasingly common. The ease of use of service robots facilitates their interaction with humans (Breazeal, 2002).

According to the data of IFR (International Federation of Robotics) (2023), it is seen that the use of robots in the world has increased by 5% (383,545 units). According to this, year of 2020 is seen as the third most successful year ever for the robotics industry, after 2018 and 2017. The world's largest industrial robot market is Asia (71%). The number of robots in 2019 (249,598) increased by 7% compared to 2020 (266,452). From 2015 to 2020, annual usage of robot has increased by 11% on average every year. Robot uses in Europe, the second largest market, grew at an average annual rate of 6% from 2015 to 2020. China, Japan, the United States, the Republic of Korea and Germany constitute the five major markets for industrial robots. These countries account for 76% of global robot usage. China has been the world's largest industrial robot

market since 2013, accounting for 44% of total uses in 2020. Especially in industrialized countries, it is seen that robots are used extensively in the country's economy. Despite the global pandemic, it is seen that the use of industrial robots around the world has increased over time.

One of the areas where service robots gain importance is the tourism sector. In the tourism and hospitality industry, service robots represent an innovative way to increase productivity of work and workforce (Alexis, 2017). In the service-based and heterogeneous tourism sector, who provides the service can affect the attitudes and behaviors of customers towards the service (Koc, 2019). The whims of people arising from their interactions with each other cause the service to be heterogeneous. The fact that service robots serve in tourism businesses reduces heterogeneity and provides a higher level of standardization (Cain, Thomas & Alonso, 2019; Ivanov, Seyitoğlu & Markova, 2020).

Among the factors affecting attitudes and behaviors towards service robots; There are the demographic characteristics (gender, generation, country) and personality of the people, as well as the type and design of the robots (Belanche et al., 2020; Breazeal, 2002). In a culture with a high power distance, one may want to interact with service robots by avoiding interacting with

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human employees in tourism and hotel businesses (Koc, 2020a). In addition to this, the appearance of the robot serving in tourism and hotel businesses can also affect the attitudes and behaviors of customers. Serving by a humanoid-looking robot can positively affect the attitude of the customer. Accordingly, in this section, the conceptual and theoretical framework, attitudes and expectations towards service robots in tourism and hotel businesses are given.

2. The Concept of Service Robot

Today, in an environment where hotel businesses are in competition with each other, it is not enough to just provide quality service to their guests. In order for hotel businesses to gain a competitive advantage against their competitors, the existing technology should be integrated into the business and the business should be able to adapt to the technological developments (Çolakoğlu, Bilgiç & Baykal, 2021; Baykal & Yazıcı-Ayyıldız, 2022). Service robots are among the technologies in tourism and hotel businesses. The number of service robots is increasing and the market for service robots is expected to grow eightfold to approximately US$50 billion by 2025 (Berns & Von Puttkamer, 2009).

The word robot is derived from the word "robota". In Czech language, this word means "worker" (Čapek, 2001). Robots, which are mechanical interfaces of smart computers, can learn movements both by interacting with their environment and with the help of the program. The high-end robot can have human characteristics. These robots can walk and talk (Ercan, 2020). In addition, these robots can interact with their environment with the help of some sensors such as voice, location, temperature, face recognition, distance, power consumption and pressure. Some actuators such as motor, screen, transmitter, robotic arm, speaker and light enable robots to grasp and move a certain object, speak, and send signals to other devices (Ivanov & Webster, 2019).

As seen in Figure 1., it is possible to classify robots according to their appearance and application purposes. According to their appearance, robots are divided into two as functional and morphological. Functional design robots are robots that are mostly used in industrial areas, designed for a specific function, and generally do not interact with humans. Morphological design robots, on the other hand, are designed with a focus on form and structure and interact with humans. Morphological design is divided into three as caricature, zoomorphic and anthropomorphic. While zoomorphic-looking robots are designed to resemble the appearance of animals, anthropomorphic-looking robots are robots designed to resemble the appearance of humans. The cartoon-looking robot, on the other hand, is designed not to resemble a living thing and can show certain movements in an exaggerated way. Anthropomorphic looking robots are divided into two as humanoid and android. Humanoid robots differ from android robots in that they are designed without fully emulating human features. Humanoid robots do not have human features such as skin, hair or eyelashes (Merkle, 2021).

The classification of robots according to application purposes is based on the ISO 8373 standard and is divided into service robots and industrial robots (as shown in Figure 1). Industrial robots are defined as "multi-purpose manipulators, fixed or mobile, automatically controlled, reprogrammable, programmable in three or more axes, for use in industrial automation applications" (ISO 8373, 2012).

There is no formally accepted definitive definition for service robots, as they represent very different structures and capabilities and are used in many different applications. (Teresa, 2012). In the late 1990s, the International Service Robots Association (ISRA) published its working definition of service robots. According to this definition, service robots are "machines that sense, think, and act to benefit or extend human
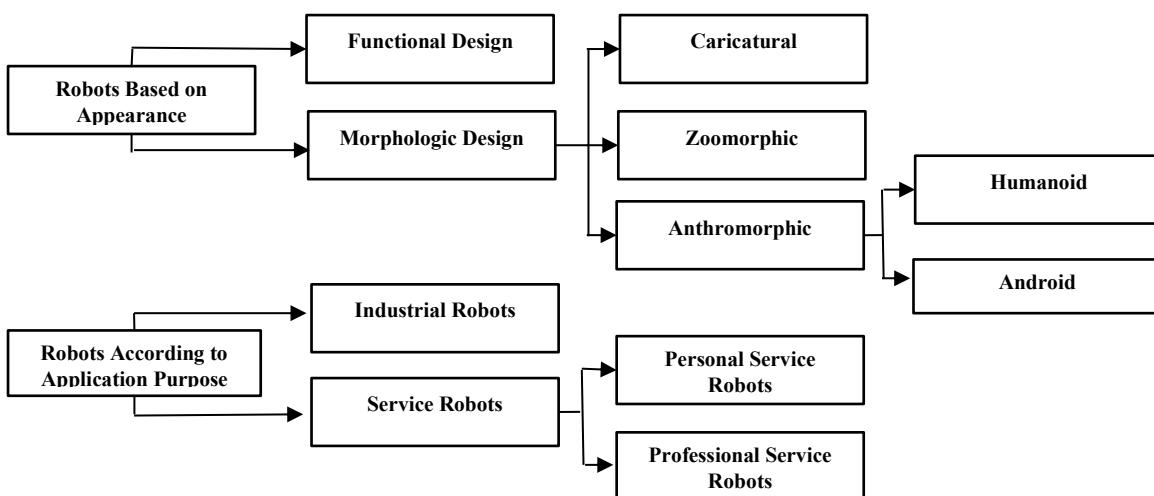

Figure 1: Categorization of Robots

capabilities and to increase human productivity" (Pransky, 1996). In other words, service robots are defined as "system-based autonomous and adaptive interfaces that interact with customers in a business and serve by communicating with customers" (Wirtz et al., 2018). Although service robots are used in industrial automation applications, they mostly perform tasks that benefit people. Service robots are divided into two different classes, personal and professional. The personal service robot is non-commercial and is for personal use by laypersons. On the other hand, the professional service robot has commercial purposes and is intended for professional use through a trained operator (Merkle, 2021). At this point, serving robots in tourism and hotel businesses are included in the class of professional service robots.

Service robots in tourism and hotel businesses provide some advantages for both employees and customers. The advantages of service robots are as follows (Yazici-Ayyildiz, Baykal & Koc, 2022; Ivanov, 2016; Ivanov, 2017):

- They can work all day (24 hours).
- They minimize costs.
- By updating their software and upgrading their hardware, they can perform many tasks and become more comprehensive.
- They can perform many tasks at the same time.
- They can ensure continuity of operations and increase service quality.
- They can minimize complexity and perform some tasks more practically.
- They provide consistency and standardization in service quality by reducing heterogeneity.
- They increase the reliability of the business in service encounters.
- They enable the business to achieve its service goals.
- They are able to complete a given task on the time and complete manner.
- They can repeat the routine work done in the business.
- They fulfil their duties unconditionally and do not get sick like human workers, do not quit their job, do not show negative emotions, do not strike and do not slack off from work.
- They provide competitive advantage and additional income.

The disadvantages of service robots are as follows (Ivanov, 2016; Ivanov, 2017):

- They are not creative.
- They need a manager to guide them (such as preparing work materials).
- They may not have a personal approach to people and needs. They don't have feelings.
- They are perceived as a threat by human employees.

- They may malfunction due to technical problems.
- Repairing their technical faults can be costly.

In tourism and hospitality, service robots are used in many areas such as distribution, entertainment, cleaning, guidance and security. Especially after the COVID-19 outbreak, the use of service robots has increased more in tasks aimed at reducing infection, such as food preparation, keeping distance in terms of safety, disinfection, monitoring and distribution (Meidute-Kavaliauskiene et al., 2021).

3. Service Robot-Customer Interaction in Tourism and Hospitality

It is important to identify the attitudes and expectations towards service robots in tourism and hospitality. It is not possible to draw certain conclusions about the attitudes of customers towards robots in the context of tourism and hospitality since robotization and automation processes in tourism and hospitality are still in the beginning phase and very few of the customers are faced with robotized service. (Kazandzhieva & Filipova, 2019).

Attitude expresses people's internal feelings and perceptions that show positive or negative tendencies towards a certain object, product, service, activity and other things (Ajzen & Fishbein, 2000). Attitudes consist of three dimensions: cognitive, emotional, and conative. In general, people's attitudes are not an exact indicator of behaviour. Sometimes only one of the three dimensions is focused (Fabrigar, MacDonald & Wegener, 2005). Complex psychological consequences lead to the formation of attitude. Attitudes are precursors of behavioral responses. It plays a critical role in the adoption of service robots (Lin & Mattila, 2021).

There are many models and theories regarding the diffusion and adoption of innovation. In particular, Rogers's "Diffusion of Innovation Theory", Davis's "Technology Acceptance Model" and Venkatesh et al's "Unified Theory of Acceptance and Use of Technology" are important models and theories for adoption of technology.

One of the theories for adoption of technology is Rogers' (1962) "Diffusion of Innovation Theory". In this theory, Rogers stated that the diffusion of innovation depends on the elements of innovation, communication channels, social system and time. The diffusion process of innovations consists of four stages. The first stage is the

information stage. At this stage, the person is little aware of the innovation and is trying to understand it. The second stage is the persuasion stage. At this stage, the person forms a positive or negative attitude towards innovation. The third stage is the decision stage. At this stage, the person accepts or rejects the innovation. The final stage is the confirmation stage. At this stage, the person is looking for the support for the decision he has made and wants to be approved by others (Rogers & Williams, 1983).
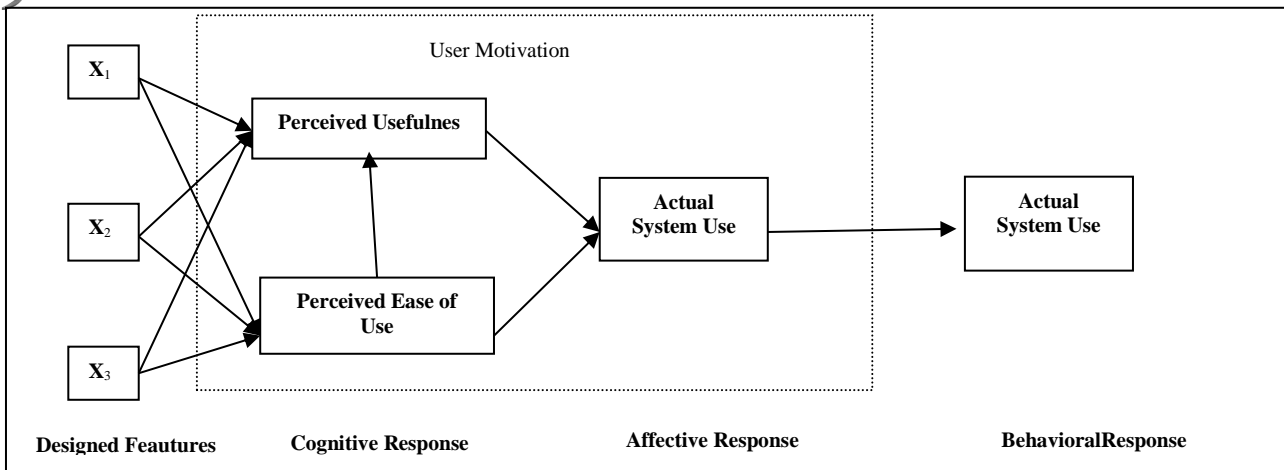
Figure 2: Technology Acceptance Model

Source: (Davis, 1985).

One of the models for people to adopt technology is Davis's (1985) technology acceptance model. According to this model in Figure 2, attitude of the person towards to particular technology is important for the adoption and use of technology. To determination of the behavioral intention, belief of the person's ability to use technology and their evaluations about the technology is useful are seen as essential elements. Perceived ease of use, perceived usefulness, attitude and intention are the four main criteria of this model. On the other hand, according to Venkatesh, Thong & Xu's (2016) united theory of acceptance and use of technology, performance expectation, effort expectancy, and social impact affect behavioral intention towards usage of the technology. Behavioral intent and facilitating conditions are determinative factors for the usage of technology.

When people are interacting with service robots, along with factors such as ease of use or usefulness, they also consider emotional and relational factors. In the design of service robots, especially the trust factor is important in order to strengthen the interaction between human and service robot. Trust in service robots is required to meet

people's expectations and create experiences together (Fuentes-Moraleda et al., 2020).

The services provided by robots to be seen as entertaining by humans and positive general attitudes towards these robots (halo effect) have great importance in conditioning positive attitudes towards the use of robots for certain purposes (Ivanov, Webster & Seyyedi, 2018). It should be considered because it affects consumer attitudes through emotions (Chtourou & Souiden, 2010).

In Figure 3, there is a model formed by the components of consumer attitudes towards robots in the travel, tourism and hotel industry, which is based on the structure of attitudes in the context of consumer behavior theory. According to this model, opinions, beliefs, thoughts, feelings and sensations about robots lead to the formation of consumer attitudes towards robots. Evaluations, actions, behavioral intentions and actual behavior about robots are projections of attitudes towards robots (Kazandzhieva & Filipova, 2019).

It is possible to examine people's willingness to adopt service robots in terms of a technological and psychological point of view. From a technological point of
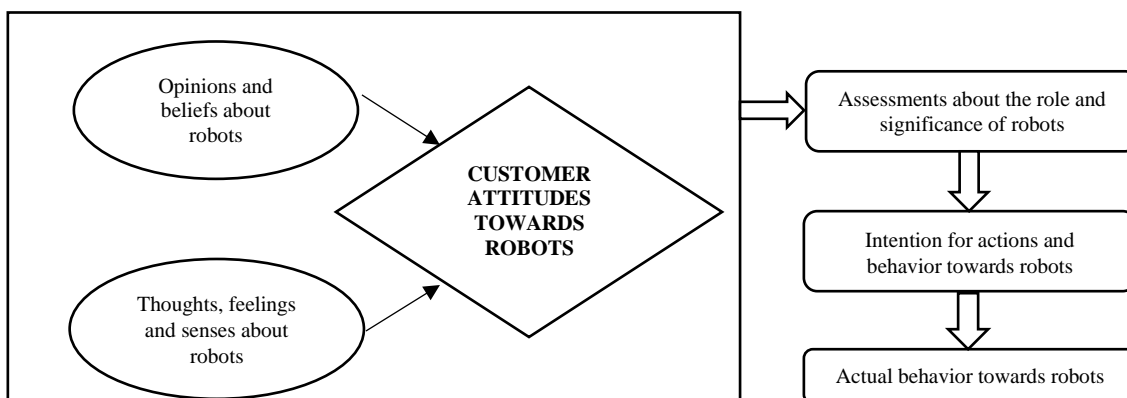

Figure 3: Interaction between the Components of Consumer Attitudes Towards Robots in Travel, Tourism and Hospitality

Source: (Kazandzhieva & Filipova, 2019)

view; the high performance of service robots and better understanding of processes and operations by people increase the possibility of people adopting service robots. In this respect, technological development in the robotic field and growth of knowledge increase people's willingness to adopt service robots. From a psychological point of view, having a negative attitude towards service robots by people will decrease the willingness to adopt service robots (Hou, Zhang & Li, 2021).

Even if the use of service robots in tourism and hotel businesses increases, the customer may resist service robots. Lack of human contact with robots and ethical concerns about unemployment can be cited among the reasons for this. Service robots that replace the human personnel pose a psychological challenge to the traditional service view. For example, anxiety caused by a robot can discourage people from interacting with it (Meidute-Kavaliauskiene et al., 2021). In addition, some demographic and psychological factors such as gender, generation, age, culture and personality can also affect attitudes towards service robots.

Comparison of Attitudes Towards Service Robots by Gender

Attitudes towards service robots may vary according to gender (Belanche et al., 2020). Genetic structure and socialization have a decisive role in the attitudes of men and women (Kotler & Keller, 2016). In general, men respond more positively to technology than women (Chen & Huang, 2016). Compared to fathers, mothers trust less to robots that give education to their children (Lin, Liu & Huang., 2012). At this point, it is seen that women are less willing to adopt and use technology than men (Reich & Eyssel, 2013). While women are willing about the ease of use of technology, men are willing to adopt and use technology (Venkatesh & Morris, 2000). The fact that service robots function as social intermediaries also increases the possibility of human service robot interaction. Matching of the service robots and consumer gender will increase the comfort level (Carpenter et al., 2009). At this point, the gender of service robots is also an effective factor in the formation of attitudes.

In the field of tourism and hotel management, gender has been examined in detail from different perspectives. Women are communal compared to men and representational orientations of men affect their attitudes and behaviours towards tourism and hotel management in terms of supply and demand (Koc 2020b). Although there are limited number of studies about customer attitudes towards service robots in the field of tourism and hotel management in terms of gender in the literature, studies (Ivanov, Webster & Garenko, 2018; Yazici-Ayyildiz, Baykal & Koc, 2022) show that attitudes towards service robots differ according to gender. Accordingly, it is seen that men are more interested in service robots than women.

3A Generational Comparison of Attitudes Towards Service Robots

Attitudes towards service robots may differ by generation (Belanche et al., 2020). According to Strauss and Howe's (1991) generation theory, the values, behaviors, attitudes and lifestyles of people born in the same period show similarity to each other (Robinson & Schänzel, 2019). People in the same generation can be affected by the same specific events that took place in the period. For this reason, it is seen that people share similar economic, cultural and political experiences and have similar values (Kotler & Keller, 2016).

The experiences of people in the same generation are not similar only due to social, cultural and economic factors, but also technological factors should be taken into account (Chen, 2010; Skinner, Sarpong & White, 2018). Young individuals can show more positive reactions to robots and technology than the elderly (Hudson, Orviska & Hunady, 2017; Onorato, 2018). The development of technology over time and the increase in the use of internet and mobile devices have caused people in the Z generation to be more exposed to technology (Turner, 2015). Therefore, the attitudes of people in the Z generation towards service robots can be more positive than the attitudes of other generations (baby boomer, X and Y generations) (Yazici-Ayyildiz, Baykal & Koc, 2022). For example, in an institution that gives medical service elderly people do not want to interact with robots because it eliminates the sense of touch (Song et al., 2016). Lazányi (2019) stated that people in the Y generation want to interact with robots less than the people in the Z generation.

In the field of tourism and hotel management, attitudes towards service robots may differ according to generations, also (Yazici-Ayyildiz, Baykal & Koc, 2022; Ivanov, Webster & Garenko, 2018). Young customers are more willing to use service robots to perform simple and repetitive tasks in the tourism industry compared to older customers (Ivanov, Webster & Garenko, 2018). At this point, especially considering that young people are more exposed to technology and are more comfortable with it, it is important that customer satisfaction research to investigate the influence of service robots on young customers (Yazici-Ayyildiz, Baykal & Koc, 2022).

A Cultural Comparison of Attitudes Towards Service Robots

Attitudes towards service robots may differ according to cultures (Belanche et al., 2020). Litvin, Crotts & Hefner (2004) and Cooper et al. (2021) explained that consumer's choices and expectations regarding a tourism and hospitality product, service or activity draw parallels with their personal self-images, to a large extent shaped by their culture. According to Hofstede (1983), the beliefs, attitudes and behaviors of people living in a country can change according to the score of that country's cultural dimension.

While culture is affected by geography (Khawar, 2017; Thapa, Yang & Chan, 2020), people's perceptions, values, attitudes and behaviors are affected by culture (Koc, 2020a). For example; individualism may lead to positive attitudes, while avoiding uncertainty can lead to negative attitudes.

According to Hall's (1989) cultural identity theory, individuals with the same cultural values may have the similar thoughts, beliefs and attitudes. While individuals with Eastern cultural values adopt the indirect communication style, individuals with Western cultural values adopt the direct communication style (Koc & Ayyildiz, 2021). Hall (1989) classified culture in two different ways as low and high context. In high-context cultures, content is less central and contextual clues need to be solved to decipher the correct code. Individuals with this type of culture use implicit messages whose meanings are embedded in people or social contexts, instead of explicit meanings when communicating. These expressions that include implicit messages are more polite, humble and acceptable. On the other hand, individuals with a low-context culture use comprehensible expressions that require little interpretation. Such cultures are also open to communication. Chinese culture is an example for high-context cultures. Although individuals with this culture use two communication styles, it is generally seen that they are more dominant in a certain type of culture (Gudykunst et al., 1996). Within the frame of this theory, individuals may feel more comfortable themselves interacting with a robot that behaves in a culturally normative way (Hall, 1989; Wang & Mattila, 2010).

Individuals may be more willing to interact with robots that seem to belong to the same cultural group (Obaid et al., 2016). Especially considering that robots are mostly developed by Japanese, it may cause Asian figures to appear more in the design of robots (MacDorman, Vasudevan & Ho, 2009). In this direction, the characteristics of the people who developed the robot may be reflected on the robots (Belanche et al., 2020). Generally, Japanese people are more exposed to robots than people in other countries (Bernotat & Eyssel, 2018). This may cause the high awareness of the Japanese about seeing robots as more advantageous and disadvantageous compared to people in other countries (Bernotat and Eyssel, 2018).

In addition, due to the potential negative effects of robots on society, some societies may approach robots with concern compared to other societies. For example; It is seen that the Japanese are more worried about using robots for this reason. While Americans are more willing to use technology and have a positive attitude towards robots, Mexicans have a more negative attitude towards robots than people in other countries (Bartneck et al., 2007). Besides, Japanese attitudes towards robots seem to be more negative than Australians (Haring et al., 2015). All these results show that culture has a significant effect on attitude towards robots.

Comparison of Attitudes Towards Service Robots by Personality

Consumers can react differently to a certain situation based on their personality characteristics (Ayyildiz, Ayyildiz & Koc, 2023). The personality of the individual may show a tendency to characteristically react in the face of similar situations. Therefore, although two consumers have equal needs, their extraversion levels may differ from each other and they may act very differently to meet the need (Mothersbaugh & Hawkins, 2016). The differences between personalities originate from internal characteristics which are a unique combination of factors and make up the individual's personality. Each individual may have one or more personality characteristics (Schiffman & Wisenblit, 2019).

Attitudes towards service robots may also differ according to personality (Belanche et al., 2020). According to Person-Environment Fit Theory, extroverts feel more comfortable and more satisfied during a service encounter (Hatipoglu & Koc, 2023). In addition to this, extroverts seem to be more willing to interact with robots that provide informal and proactive service. Such people have less problems interacting with those who act as automatic intermediaries (Chen et al., 2011). Introverts, on the other hand, tend to avoid social interaction (Tung & Au, 2018). For this reason, it is possible for such people to prefer to receive service by robots instead of humans in service encounters. In addition, introverts want to receive service from mechanical-looking robots (Walters et al., 2008). Attitudes towards robots may differ according to personality traits such as openness, conscientiousness, harmoniousness and neuroticism included in Goldberg's (1990) personality theory. Therefore while designing the robot, it may be matched with the personalities of the consumers, taking into account the formality of the robot or the human aesthetic (Belanche et al., 2020). At this point, personality appears to be an important factor in people's attitudes towards service robots.

Comparison of Attitudes Towards Service Robots by Robot Type and Design

Attitudes towards service robots may differ depending on the type and design of the robot (Belanche et al., 2020). In general, consumers can attribute human characteristics to any non-human entity (Epley, Waytz & Cacioppo, 2007). While designing a brand or product, a human characteristic that we call anthropomorphism (such as a smile or face shape) can be used to increase consumers' interest and participation in the brand or product and to make them make positive evaluations (Lu, Cai & Gursoy, 2019). The use of any human feature in the design of robots can facilitate the interaction of humans with robots. Robots, that more human characteristics are attributed and which

are more human-like or offer perceived intelligence, are more preferred by consumers (Qiu et al., 2020). In the interaction of humans with robots; human features such as a human head and facial expressions that show emotion or intention are used more (Belanche et al., 2020).

A robot to which human characteristics are attributed more strengthens emotional commitment in interaction with humans, ensures positive perceptions and attitudes, increases trust and preference compared to other robots (Van Pinxteren et al., 2019). The reason for this can be shown as that robots that resemble humans evoke more affinity (Belanche et al., 2020). Sometimes, a robot that has high levels of human resemblance, can be frightening (Walters et al., 2008).

4. Application Areas of Service Robots in Tourism and Hotel Management

Robots can provide serving directly or by assisting an employee in charge in hotel businesses. Today, it is possible to encounter robots that are receptionists, luggage carriers and keepers, and room assistants in hotel businesses. On the other hand, some hotels offer services up to the rooms through robots to meet the requests of their guests. Hotel guests can enter and exit the hotel with the help of robots without the help of an employee. On the other hand, some hotel businesses provide the opportunity to make entry and exit transactions via mobile devices (İbiş, 2019).

Henn na Hotel is the first hotel that provides service by robots. This hotel combines various advanced technologies to offer its guests a comfortable accommodation (Henn na Hotel, 2023). The Mandarin Oriental Hotel in Las Vegas has introduced Pepper as its newest humanoid staff member. Pepper lives in the lobby, where he greets guests and give them directions. Its mission is to provide information to hotel guests in a fun and innovative way (Paluch, Wirtz & Kunz, 2020). Connie, the first Watson-powered robot concierge in collaboration with Hilton Worldwide and IBM, informs hotel guests about local tourist attractions, meals, and the hotel (Winimy, 2023). The luggage will be delivered to the room by a doorman robot, and the doorman robot Tully will turn the light on and off for the guest (Paluch, Wirtz & Kunz, 2020). At Aloft Hotel, on the other hand, a butler robot provides service to take the requests of the hotel guests to their rooms (BBC News, 2014). A robot named Dash, produced by Savioke, provides service at the Crowne Plaza Hotel, which fulfills the requests of the hotel guests quickly and smoothly (Crowne Plaza Hotels & Resort, 2015). At Yotel, the world's first robot baggage handler which keeps the luggage of hotel guests in 150 boxes provides service to guests (Yotel New York, 2023).

Recently, robots have started working as chefs in restaurants. For example, CaliBurger developed Flippy, a robot that cooks burgers in Pasadena, California. Also, Massachusetts Institute of Technology students and celebrity chef Daniel Boulud founded the Spyce restaurant in Boston, where food is cooked entirely by robots in an automated kitchen. It is considered to be the first restaurant with a robotic kitchen that can cook complex dishes (Fuste-Forne, 2021).

Robots are used at airports for passenger guidance, maintenance or security purposes. At Amsterdam Schiphol airport, the robot Spencer scans KLM passengers' boarding passes and helps them find the right departure gate. Kate, the self-sustained check-in kiosk robot, works at Kansai airport in Japan, sensing busy areas and getting there autonomously, help for reducing passengers waiting times. At Incheon airport in South Korea, cleaning robots are sweeping the airport, and at Shenzhen's Bao'an International Airport, Anbot, a security robot, patrols the departure lounge for suspicious behaviour (Paluch, Wirtz & Kunz, 2020).

5. Expectations About Service Robots in Tourism and Hospitality

Before purchasing the service, tourists expect the quality to be at a certain level. In the case of service provided, tourists develop feelings about service experience and quality of experience (Grönroos, 1990). According to the Expectation Disapproval Theory, if a tourist's expectation for a particular service is higher than the service experience, it will lead to dissatisfaction. However, if the expectation level of the tourist is lower than the service experience, it will ensure satisfaction (Oliver, 1980).

The fact that tourists cannot experience service robots sufficiently shows that it is unlikely that there will be major changes in their attitudes and behaviors in the short term. Attitudes and expectations of tourists do not only depend on the complete robotization of the service, it also depends on unified services that combine mixed formats. In order to satisfy the existing customer, the support of human employees is also needed along with service robots. The inclusion of service robots in this combination will support the customer experience and facilitate the adoption of the robotization process (Kazandzhieva & Filipova, 2019). For example; Hotel guests are more likely to see and meet human employees in hotels than service robots. Instead of utilizing self-ordering kiosks and robotic services in a hotel business, they want to establish relationships with human employees. It is considered as sincere behaviour for the human employee to smile by addressing the hotel guest by name (Choi et al., 2020). However, if the use of service robots becomes widespread, the idea that human employees will be unemployed is dominant (Meidute-Kavaliauskiene et al., 2021). For these reasons, tourists want human employees to serve compared to service robots.

One of the important factors affecting the adoption of service robots is the inclusion of human characteristics in the design of service robots. Because of lack of emotion, negative attitudes may occur towards service robots. In

order for service robots to respond with compassion during interaction, human body movements, facial expressions and speech must be defined in their design. The behavior of a service robot developed with these features should be consistent with the behavior of the human employee (Chiang & Trimi, 2020).

The fact that tourists have different cultures may cause different attitudes towards service robots. Tourists in cultures with a high power distance consider themselves superior to human employees. Therefore, instead of interacting with human employees, they interact with service robots (Koc, 2020a). However, tourists from this culture may prefer to interact with human employees instead of service robots in order to fulfil their wishes and desires and satisfy their egos (Yazici-Ayyildiz, Baykal & Koc, 2022).

In order for service robots to be adopted by tourists, the concept of trust must also develop. If tourists are not satisfied with the reliability and security of service robots, they may exhibit a negative attitude (Chiang and Trimi, 2020). Especially during the COVID-19 epidemic, the use of service robots has increased even more. Tourists trust service robots more than human employees, as they avoid contact with human employees when interacting with them and consider service robots necessary (Yazici-Ayyildiz, Baykal & Koc, 2022).

In addition, the speed of the service is also effective in creating a positive attitude towards service robots. Service robots can perform complex tasks faster than human employees. In order for the service to be considered as high quality by the tourists, service robots must provide instant service (Chiang & Trimi, 2020).

6. Conclusion

The rapid development of technology makes it difficult for consumers to adopt innovations. Especially in tourism and hotel management, the integration of a new technology into the business is more difficult because it is based on service and also cost wise. For this reason, the number of tourism and hotel businesses that provide service by service robots is limited today. The lack of service robots in tourism and hotel businesses negatively affects the interaction between the customer and the service robot. The fact that customers cannot experience service robots better makes it difficult to determine attitudes and expectations towards such technologies.

Although it is seen that a limited number of service robots provide service, the robotization process that will grow in the near future will increase the chance of customers to experience it. According to research, concerns such as that service robots will replace the human staff in tourism and hospitality may not take place in the short term. This is because service robots may not match human staff in various aspects of tourism and hospitality activities. Primarily, service robots do not understand emotions and react accordingly. However, there is a prevailing opinion

that the compensation of some service failures may be handled better by human employees rather than the service robots.

There are some disadvantages brought by the difficulties in adopting service robots (Ivanov, 2016; Ivanov, 2017). One of these difficulties is the failure of service robots due to technical problems. In such a situation, it can be expensive to repair service robots. So, the use of service robots in hotels can bring some difficulties in terms cost. Apart from this, service robots need a director to direct them. In this situation the hotel business will have to allocate a budget for both service robots and their guide.

There are also some positive attitudes towards service robots. It is thought that service robots have benefit especially in the standardization of the service and the coordination of complex tasks. However, attitudes towards robots may differ due to the appearance of robots. Customers have a more positive attitude towards a service robot to which human characteristics are attributed. Moreover, the ability of service robots to work and carry out a lot of duties at the same time will bring important advantage for the hotel business to minimize the cost. Especially personnel expenses is one of the important expenses for a hotel business (Phillips, 2002). So, the use of service robots in hotels instead of people can provide profit for the business. Another difference between service robots and employees is that service robots can improve themselves by updating. The education expenses of employees is an economic burden for the businesses. The use of service robots can minimize the expenses which is spent for education. The fact that service robots bring certain standardization and as the result of this it provides consistency is one of the advantages of service robots. When it comes to think that service quality affect (Sari et al., 2023) the customers' satisfaction positively, the use of service robots can enhance the customer satisfaction. Moreover, because service robots carry out the duties given to them in time and complete, they are trusted more by hotel guests. The trust of hotel guests affect the customers' intention of repurchase (Upamannyu et al., 2015). So, the use of service given by robots can affect the customers' intention of repurchase positively.

The importance of service robots has been understood with the outbreak of covid-19 in 2019. This epidemic affected people socially, economically and politcally. One of the most affected sectors due to the epidemic is accomodation sector. ıt is likey that guests will prefer the hotels with the least risk of transmission of virus and social isolation. At this point the use of service robots in hotels increase the participation of guests into the tourism. As it is mentioned by Çuhadar et al. (2022) and Sigala (2020) it is necessary for a manager to focus on the use and benefits advanced technology such as use of robots.

In this compilation study that focuses on the attitude and behavior of hotel guests towards service robots, the examples from outside of Türkiye has been included. The

fact that not enough research has been made so far and the limited use of service robots is the reason of this situation. In the next researches, the use of service robots can be searched in Türkiye. Furthermore, in this research the attitude and behavior of hotel guests have been focused on. In the next researches, compilation study made on travel agency, food and drink business or the attitude and behavior of hotel guests towards the service robots can be made.

In future research, with the widespread use of service robots in tourism and hotel businesses, it will be easier to determine the attitudes of customers towards to service robots. For this reason, it is necessary to determine the attitudes towards service robots that are more human-like and have empathetic intelligence. Besides, including emotional abilities in the design of robots can increase service quality and enable customers to have more positive attitudes towards service robots.

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Tourist Behaviour after Service Robots

Abstract

This is a conceptual review paper explains and discusses the role and potential of service robots in tourism and hospitality from the perspective of consumer behaviour. The adoption and use of robots have increased rapidly in tourism and hospitality over the past few years due to a number of reasons. With the developments in digital technology and artificial intelligence, the use of robots has become cheaper and easier for businesses in various industries including tourism. Moreover, the developments such as the Covid-19 pandemic accelerated the adoption of robots in tourism and hospitality where interaction with the customer is frequent and intense. In line with the growth of the adoption and the use of service robots in the industry, there is a growing body of research in the field. The future potential of service robots and their adoption by businesses depend very much on a better understanding of service robots. This review study explores attitudes and expectations of consumers regarding the use of service robots at hotels.

Keywords: *Service robots, Tourism, Hospitality, Attitude, Expectation.*

Authors

Full Name	Author contribution roles	Contribution rate
Erdoğan Koç:	Conceptualism, Resources, Writing - Review & Editing	34%
Ahu Yazıcı Ayyıldız:	Conceptualism, Resources, Visualization	33%
Muhammed Baykal:	Conceptualism, Investigation, Resources, Writing - Original Draft	33%

This paper does not required ethics committee report

Justification: The methodology of this study does not require an ethics committee report.