



Robotisation in travel and tourism: Tourist guides' perspectives on robot guides

Robotização nas viagens e no turismo: Perspectivas dos guias turísticos sobre os guias robots

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Abstract

This study investigates the advantages and disadvantages of using robot guides and the challenges that tour guides may face when integrating these robotic assistants. Qualitative research methods were employed to explore the viewpoints of tourist guides concerning robotisation in the travel and tourism industry. Semi-structured interviews, conducted via video calls on an online platform with 20 different tourist guides, were selected as the primary data collection method. Thematic analysis was employed to analyse the data. The results revealed that the tourist guides who participated in the study generally held negative views on using robots in tourist guidance. They expressed scepticism about the immediate impact of robot guides on tourist guidance. However, there was a consensus that in the long term, the introduction of robot guides might reduce the number of human tourist guides. Therefore, this study suggests a collaborative approach between robots and human tour guides could yield mutually beneficial outcomes.

Keywords: Hospitality Technology, Tourist Guidance, Robotics in Tourism, Robot Guide, Tour Guide, Service Robot.

Resumo

Este estudo investiga as vantagens e desvantagens da utilização de guias-robots, bem como os desafios que os guias turísticos podem enfrentar face à introdução destes assistentes robóticos. Foram utilizados métodos de investigação qualitativa para explorar os pontos de vista dos guias turísticos relativamente à robotização na indústria das viagens e do turismo. Optou-se por entrevistas semi-estruturadas como método de recolha de dados primários, realizadas através de videochamadas numa plataforma online com 20 guias turísticos diferentes. A análise temática foi utilizada para analisar os dados. Os resultados revelaram que os guias turísticos que participaram no estudo tinham, em geral, opiniões negativas sobre a utilização de robots na informação e orientação turística. Manifestaram ceticismo quanto ao impacto imediato dos guias-robots na informação e orientação turística. Por outro lado, foi consensual que, a longo prazo, a introdução de guias-robots poderia levar a uma redução do número de guias turísticos humanos. Por conseguinte, este estudo sugere que uma abordagem de colaboração entre robots e guias turísticos humanos poderia produzir resultados mutuamente benéficos.

Palavras-chave: Tecnologia Hoteleira, Orientação Turística, Robótica no Turismo, Guia Robot, Guia Turístico, Robot de Serviço.

1. Introduction

Robot technology has widespread applications across the tourism industry, offering numerous advantages. Robots are employed in various sectors, including accommodation businesses, airports, and tourist guide services. The ongoing advancements in robotic technologies and artificial intelligence have piqued the interest of tourists and are driving successive waves of innovation. Some experts predict that robots in the tourism sector will become even more active as this transformation process continues (Ivanov et al., 2017).

In the modern era, robots play a pivotal role in social and practical aspects, offering support in high-traffic locations such as airports. They provide services like welcoming passengers, offering consultations, delivering multilingual support, and providing guidance for duty-free shopping (İbiş, 2019). Robots also take on various roles, such as serving as waitresses in food and beverage establishments, disseminating information in hotels, and assisting tourists (Yalçın Kayıkçı & Kutluk Bozkurt, 2018). Furthermore, they are utilised in websites, touch screen kiosks, robot assistants, and chatbots used in call centres (Ukpabi et al., 2019). Notably, the tourism industry features a range of humanoid robot models, including ALO at Starwood Aloft Hotel, robots at Henn na Hotel, bartender robots at Royal Caribbean Hotel (Özgürel & Şahin, 2021), and Sanbot at China Airports (Yalçın Kayıkçı & Kutluk Bozkurt, 2018). Spencer, known as Troika, is also operational at Schiphol Airport in South Korea (İbiş, 2019).

The growing prevalence of robots in the hospitality industry has led to increased academic research on this subject. These studies predominantly focus on understanding consumers' perceptions of robots and their impact on the industry (Luo et al., 2021; Chuah & Yu, 2021; Lee, Lee & Kim, 2021). Research on robotisation in the tourism industry predominantly centres on how robots impact the guest experience and their acceptance by guests. While limited in number, some studies have been dedicated to gaining insights into the perspectives of individuals employed within the hospitality sector regarding their interactions and collaboration with robots (Ali et al., 2022; Parvez et al., 2022; Yu et al., 2022). Many of these studies have primarily concentrated on the hotel industry, considering both customer and employee perspectives.



In the realm of tourist guides, a crucial element of the tourism sector, a limited body of research exists on the utilisation of robots for tourist guidance. While psychological studies on human interactions with machines are available in the literature (Tekerek, 2009; Stricker et al., 2012; Boboc et al., 2014), no international study has been identified that delves into the viewpoints of tourist guides regarding robot guides. In a systematic review, Saydam et al. (2022) emphasised the need for more research on employee attitudes towards robots and robotisation. Therefore, this study seeks to address the research question: "What are the viewpoints of tour guides regarding robotic tour guides?" It is evident that the transformation that has commenced in other facets of the tourism industry, such as hotels and restaurants, will also impact the profession of tourist guidance. Considering the global employment rate of tourist guides within the tourism sector, it becomes imperative to understand the perspectives of these guides regarding robot guides. Furthermore, a study conducted by Çevrimkaya and Zengin (2023) revealed that tourist guides also contribute to shaping the image of destinations. Hence, potential changes in this domain will likely influence the perception of destinations. In this context, this study was designed to investigate the advantages and disadvantages of incorporating robotic technologies in tourist guidance and examine the challenges experienced and anticipated in tourist guidance, all from the perspectives of tourist guides.

2. Literature review: Robot guides

In the realm of tourist guidance, robots have found active applications in various museums and historical sites. Humanoid robots are capable of providing commentary on artworks, sculptures, and exhibits in museums while engaging in interactive communication with visitors. Among the most renowned examples are social robots like Pepper, which serves at the Smithsonian Museum; Rhino, located at the German Museum in Bonn; and SAGE, in operation at the Carnegie Museum of Natural History. In addition to these indoor robots, Robohon, the first outdoor-serving robot in Kyoto, Japan, was developed in 2017 (Vásquez & Matia, 2020).

One noteworthy example is RoBoHon, the first open-space humanoid robot supported by artificial intelligence, owned by Sharp in Tokyo. Since 2018, it has offered tourist guidance services in Japanese, Chinese, and English to tourists in Kyoto. This robot can be rented from a travel agency to provide full-day tour-guide services and is recognised as the first open-space robot for tourist guidance (Cort, 2019).

As indicated in Table 1, robot tourist guides, which made their debut in 1998, have made significant progress to this day. The integration of the human-machine relationship alongside the traditional human-human interaction has ushered in the digital transformation era. These robot guides, accompanying visitors during museum and exhibition tours and providing information about the exhibited objects while responding to questions, represent pioneers of the human-machine relationship within the tourist guidance profession.

Table 1- Tour-guide robots

Name	Installation location	Country
Rhino	Deutsches Museum Bonn	Germany
Minerva	Smithsonian's National Museum of American History	USA
Sage	Carnegie Museum of Natural History in Pittsburgh	USA
Chips	Carnegie Museum of Natural History	USA
Sweetlips	North America Wildlife Center	USA
Joe Historybot	Heinz History Center	USA
Care-o-bot	Museum für Kommunikation	Germany
Hermes	Heinz Nixdorf Museums Forum	USA
Jinny	National Science Museum of Korea	Korea
Robovie	Osaka Science Museum	Japan
Enon	Kyotaro Nishimura Museum	Japan
Urbano	Principe Felipe Museum	Spain
Indigo	Cultural institute	Greece
Cicerobot	Archaeological Museum of Agrigento	Italy
Tawabo	Tokyo Tower	Japan
Frog	The Royal Alcazar	Spain
Asimo	Miraikan National Museum of Science and Innovation	Japan
Aggie	Art Gallery of Western Australia	Australia
Pepper	Smithsonian Museum	USA
Unnamed	Jaipur Wax Museum	India
Robox	Swiss National Fair 02.	Switzerland
Toyota	Toyota Kaikan Fairground	Japan
Mona, Oskar	Berlin Opel Fair	Germany
RoBoHon	Kyoto	Japan

Source: Boboc et al., 2014; Yıldız, 2019.



The results from a study by Nazlı (2020) indicate that tourist guides do not foresee an immediate negative impact on their profession due to digital developments. However, they acknowledge the looming threat posed by robots equipped with artificial intelligence, the adoption of digital applications, and smart technologies. Similarly, Sotohy (2020) stated in his study that guiding is fundamentally human activity, stressing that the personal approach of tour guides, the depth of their experience, and their unique interpretations are the essence of their profession. Sotohy firmly believes that digital tools can never fully replace human interaction's emotional depth and personal connections.

In their study, Samala et al. (2020) revealed that artificial intelligence is crucial in assisting tourists who encounter language barriers while visiting foreign countries. These AI tools facilitate interactions with local individuals, eliminating the need for assistance from a local guide. Consequently, AI technology is seen as a potential substitute for human resources, potentially replacing local guides in tourism destinations. Bose et al. (2022) asserted that the use of robotic technologies, as observed in various other tourism industry sectors, is gaining widespread popularity within tour guidance. In particular, autonomous robots with humanoid features are considered to be the future of tour guidance in the coming years. With numerous countries and companies actively engaged in developing humanoid robots as companions for humans, robots will likely assume the roles of local tour guides.

Webster and Ivanov's (2022) study sheds light on tourists' perceptions of using robots in museums and galleries. Their results indicate that tourists hold favourable viewpoints about humanoid robots in these cultural spaces. As emotionally programmed robots have been developed, visitors have become increasingly aware that they are interacting with a robot and have come to expect human-like emotional responses. Accordingly, it is anticipated that in the future, robots will not only serve as informative tour guides but will also engage with tourists as if they were local guides.

Zhang's (2022) study draws a valuable conclusion regarding the role of robot guides in enhancing service standardisation in tourism. These robotic guides are seen as effective solutions for addressing tourist complaints related to service quality during their visits. The use of smart tools has the potential to significantly reduce complaints about service quality and positively influence visitors' perceptions. From the author's perspective, local tour guides should embrace digital tools to minimise the risk of job displacement. It is expected that in the future, smart oversight of robot guides will be enhanced to minimise tourist complaints. Robot guides are well-equipped to provide comprehensive tourism information across six key components: tours, shopping, entertainment, dining, lodging, and travel. This capability allows them to deliver top-tier travel advisory services to visitors. In addition, robot guides offer customisable music and dance experiences for guests during downtimes and employ advanced settings for perception, behaviour, and problem-solving to address complex issues faced by tourists. This enables more accurate analysis and responses to visitor inquiries. Investing in these robots can reduce the need for additional staff in security, cleaning, and explanatory roles.

3. Methodology

Qualitative research methods provide in-depth insights into complex phenomena, capture unique and unforeseen occurrences, and shed light on the experiences and interpretations of individuals with diverse interests and roles. They are instrumental in guiding the development of theories and hypotheses and facilitate the progression toward comprehensive explanations (Sofaer, 1999). This study aims to investigate the ongoing robotic developments, which are continuously evolving and reshaping the landscape, from the perspectives of tourist guides. To accomplish this, the study adopted qualitative research methods to delve into the viewpoints of tourist guides regarding the integration of robots within the tourism industry. For this purpose, the thematic analysis method was employed. This approach enabled the identification, analysis, and presentation of recurring patterns within the data set. Additionally, it facilitated an examination of the similarities and differences in the views expressed by the participants.

3.1 Sampling

The study utilised a non-probability purposive sampling method, where participants were selected based on their expertise and knowledge relevant to the research topic. The study sample comprised 20 tourist guides who were officially registered with the Istanbul Chamber of Guides. The selection of tourist guides in Istanbul as the study's sample was purposeful and deliberate. Several factors contributed to this choice. Istanbul is renowned as the Turkish city with the highest influx of tourists, attracting visitors from a wide range of countries. It is a hub where technological advancements are most extensively incorporated into tourism. Furthermore, Istanbul stands out as a city where tourism employment has witnessed significant growth and development. It also leads in terms of the number of tourist guides operating in the region. Additionally, the city of Istanbul has been a pioneer in introducing innovations within the tourism industry. According to data from 2019 (Global Destination Cities Index report published by Mastercard), Istanbul is ranked among the world's top 10 most visited cities. Given these compelling reasons, Istanbul was the preferred location for conducting this study.



3.2 Data Collection Technique

In this study, the data collection technique chosen was semi-structured interviews, as they offer the advantage of gathering detailed information while maintaining a certain level of standardisation and flexibility. Under the qualitative research approach, a semi-structured interview form was developed, which included questions about robotisation in tourism and aligned with the relevant literature review. Following feedback from experts in the field, the semi-structured interview form was finalised and consisted of a total of six questions. Two questions focused on technology (Doğan & Vatan, 2019), while the remaining four focused on robotisation (Christou et al., 2020; Vatan & Doğan, 2021). The interviews were conducted via video calls on an online platform between November 11, 2020, and December 19, 2020. This choice was made due to COVID-19 restrictions that limited in-person interactions. The average duration of the interviews was approximately 35 minutes. Detailed notes spanning four pages were taken throughout the interviews. Subsequently, the interviews were transcribed, resulting in about 35 pages of transcripts. The interviews were conducted in the Turkish language. After the analysis of the interviews, the results were translated into English for presentation and reporting.

3.3 Data Analysis

The study data analysis was conducted using the thematic analysis method, drawing upon the framework established by Braun and Clarke in 2006. The thematic analysis was carried out systematically across six distinct stages. After the interviews, the transcribed data was meticulously reviewed. Initial thoughts and insights were recorded. The data collection process involved recording online interviews, transferring the collected data to a computer platform, and iteratively listening to the audio recordings to create written transcripts, resulting in a comprehensive 35-page transcript. Subsequently, the transcripts underwent a rigorous proofreading process involving multiple listens to eliminate errors or discrepancies. In the next phase, the data provided by the interviewees was gathered according to the relevant questions, taking into account their statements as a whole. After thoroughly examining the raw data, coding and thematisation was initiated. Two separate researchers independently coded each piece of data during the analysis process. To ensure internal consistency in the data analysis process, Cohen Kappa fit values were calculated among the coders, indicating a good level of agreement at 87%. Upon completing the analysis, a criteria checklist (transcription, coding, analysis, overall, written report) for functional thematic analysis, as presented by Braun and Clarke (2006), was used as a control. Two researchers independently coded the data and reviewed the identified themes to ensure consistency. This involved discussing and reaching a consensus on the coded data in various formats.

4. Results

Based on the data collected through semi-structured interviews, thematic analysis was employed to examine the insights provided by 20 tourist guides—ten women and ten men—registered with the Istanbul Chamber of Tourist Guides. The results from these interviews were organised and presented in tables. In the initial part of the interview form, various themes emerged from the technology-related questions directed towards the tourist guides. These themes encompassed the applications of information technologies, the positive and negative impacts of technological devices on the guidance profession, and guidance-oriented mobile applications. The most commonly discussed sub-themes were collated and are presented in tables.

As outlined in Table 2, when the tourist guides were queried about their use of technology during tours, the most frequently recurring sub-theme revolved around navigation applications. Below are a few excerpts from the participants in this sub-theme:

P6: "During the tour, I use apps such as maps, GPS, etc."

P10: "If our guest is lost or asks about a place, it makes our job easier to share the location."

Table 2 - Technologies used by tourist guides during the tour

Theme	Sub-themes	n	%
Technology uses	Navigation Apps	9	45
	Communication	8	40
	Information sharing platforms	6	30
	Instant messaging apps (What's App, WeChat, etc.)	5	25
	Online document use (book, journal, etc.)	3	15
	3D and 2D image sharing	3	15
	E-mail apps	3	15
	Traffic density information	2	10

Source: Authors' work



As summarised in Table 3, themes and sub-themes were established based on the responses to questions regarding the impact of technological devices on the tourist guidance profession and the influence of guidance-oriented mobile applications on the same profession. According to the observations of the tourist guides, the most significant advantage of technological devices in tourist guidance is their role in increasing tourists' awareness. Some responses from the participants include:

P11: "It allows tourists to research before arriving, which enables better quality tours."

P12: "It has a positive effect. Compared to the past, we now serve tourists who have more information. The tourist profile has changed in this way."

Table 3 - The impact of technological devices and guidance-based practices on the profession of tourist guidance

Theme		Sub-themes	n	%
The impact of technological devices on tourist guidance	Positive effect	Increasing awareness in the tourist profile	4	20
		Easy access to the information	3	15
		Convenience of communication	1	5
	Negative effect	Information pollution	6	30
		Enquire about the guide's explanation	5	25
		Increase in self-guided travel	4	20
		Drop in extra tour sales	4	20
		Tourist distraction	1	5
The impact of guidance-based mobile applications on the tourist guidance profession	Increase in illegal guidance activities	1	5	
	Does not affect the profession	6	30	
	Decrease in participation in tours	5	25	
	Increase in self-guided tours	3	15	
	Increase in tour quality	3	15	

Source: Authors' work

The most frequently recurring sub-theme is how technological devices can create information pollution. A portion of the responses expressing the "information pollution" sub-theme, supported by approximately 30% of the participants, includes:

P1: "Sometimes, there is inaccurate information on the internet. It may contradict the guide's description. It happens, although not very often."

P6: "Since everything (correct or incorrect) is available on the Internet, tourists may ask questions based on what they find and potentially make decisions that differ from the guide's recommendations."

P15: "However, it can be challenging to alter people's perceptions due to the information pollution on the internet."

When participants were asked about the impact of guidance-based mobile applications incorporating QR codes, augmented reality, and virtual reality technology, the most frequently repeated sub-theme was that these applications did not significantly affect the tourist guidance profession. Some responses supporting the "Does not affect the profession" sub-theme included:

P7: "It doesn't have much of an effect for now because these technologies are not fully developed, but they may have an effect in the future. However, they cannot replace tourist guidance."

P9: "This does not have an effect yet. Most people do not prefer to use it."

The second part of the semi-structured interview form featured questions related to robot guides. These inquiries led to the identification of several themes, including the desired features of robot guides, potential advantages and disadvantages of robot guides, the positive and negative effects of robot guides on potential issues, the collaboration between human guides and robot guides, and the potential impact of robot guides on the tourist guidance profession.

In Table 4, the research theme, which focuses on the features that robot guides should possess, led to the identification of 11 sub-themes based on the responses provided by the tourist guides. Among these sub-themes, the most frequently recurring ones included the necessity for robot guides to have anthropomorphic features and emotional intelligence.

**Table 4 - Features that robot guides should possess**

Theme	Sub-themes	n	%
Features that robot guides should possess	Anthropomorphic features	7	35
	Emotional intelligence	7	35
	Communicating	5	25
	Problem-solving ability	5	25
	Ability to communication	3	15
	Empathy	2	10
	Ability to distinguish between true/false information	2	10
	Understanding the demands-questions correctly	2	10
	Socialisation	2	10
	Sense of humor	2	10
	Being the leader of the tour group	1	5

Source: Authors' work

Participants' statements in support of the idea that robots should have anthropomorphic features (human-like characteristics) are exemplified by the following responses:

P1: "There is no possibility for them to replace human guides if they do not have human-like characteristics."

P4: "Unless a computer is a living creature with a brain like a human, it will be treated like a computer. So, it has to be human."

P16: "It is essential for guides to build connections with people and conduct programs by getting to know tourists, rather than merely providing explanations. The absence of human emotions in robots is a significant shortcoming in this regard."

Conversely, sub-themes associated with emotional intelligence received substantial attention. Here are a few statements supporting the emotional intelligence sub-theme:

P8: "If one day, they manage to add an emotional feature to robot guides, perhaps these robots could be considered as substitutes for tourist guides."

P9: "They can't do it; tourist guidance is a job that only humans can perform. Robots without emotional intelligence will be inadequate. The human touch will be lost, and there will be a mere transfer of information."

P11: "It's challenging to satisfy a guest if you fail to understand them."

As outlined in Table 5, under the theme of possible advantages and disadvantages of robot guides, a total of 12 sub-themes were identified.

Table 5 - Robot guides' potential benefits and drawbacks

Theme	Sub-themes	n	%	
Robot guides' potential benefits and drawbacks	Benefits	Richness of information resources	8	40
		Reliability of information sources	4	20
		Decreased tour costs	3	15
		Multilingual guidance	2	10
		Standardisation in tour	1	5
	Drawbacks	Lack of initiative	5	25
		Lack of interactive communication	4	20
		Lack of problem-solving	4	20
		The program becomes monotonous	4	20
		Lack of human emotions	3	15
		Inability to provide guest satisfaction	3	15
		Lack of sense of humour	2	10

Source: Authors' work

Among these sub-themes, the most frequently recurring sub-theme within the advantages category was the "richness of information resources." Here are statements from participants supporting this sub-theme:

P1: "It is an advantage that the robot guide can answer every tourist question."



P5: "As it will easily follow up-to-date information with the internet, it will convey accurate information to the guest. Therefore, the reliability of the information it shares will also be very high."

P13: "It will be an advantage for the tourist to reach the desired information in a versatile and fast manner."

Conversely, the most frequently repeated sub-theme within the disadvantages theme was "not taking the initiative." Several participants expressed their views supporting this sub-theme:

P13: "I think it is a big disadvantage since robot guides lack faculties such as taking the initiative."

P19: "A robot cannot be flexible. Tourist guides are advantageous in this regard, as travel is freedom-based, items in plans can be stretched, added, removed, changed."

As presented in Table 6, viewpoints were gathered regarding the potential collaboration between human and robot guides during tours, focusing on the implications of such cooperation. These viewpoints were categorised into positive and negative effects, revealing various perspectives on this topic.

Table 6 - Working with robot guides

Theme		Sub-themes	n	%
Working with guides and robot guides	Positive effect	Facilitation of business	9	40
		Dealing with visitors on a one-on-one basis	4	20
		Information support for tour guides	3	15
		Be attractive to the tourists	2	10
		Increase in guest satisfaction	2	5
		Multi-language support	2	25
		Increase in tour security	1	20
		Reduction in program disruption	1	20
	Negative effect	Don't want to work together	4	20

Source: Authors' work

Within the positive effects, the most frequently recurring sub-theme was facilitating the guide's work. Participants provided statements supporting this sub-theme:

P1: "The idea of working together is nice. As long as the guide remains in control, receiving direct support from artificial intelligence for tasks such as providing information, helping manage the tour's flow, addressing issues like traffic problems or accidents, and enhancing safety could be beneficial. It would streamline things."

P10: "If they collaborate, tasks such as guiding the robot along the route, verifying whether guests are on the bus, preventing them from getting lost, issuing instructions at restaurants, and offering translations in the guest's native language can be delegated to the robot, thereby lightening the guide's load."

Table 7 presents sub-themes related to the impact of robot guides on the tourist guidance profession. Notably, the most frequently recurring sub-theme indicated that robot guides would not significantly affect the profession. While 35% of participants argued that robot guides would not have a substantial impact, 30% asserted that they could potentially lead to unemployment among human guides.

Table 7 - Possible effects of robot guides on the tourist guidance profession

Theme	Sub-themes	n	%
Possible effects of robot guides on the tour guidance profession	Will not affect the profession	7	35
	Causes unemployment	6	30
	Increase in thematic tours	2	10
	Being popular for a while and disappear	2	10
	Increase in participation in tours	1	5
	Evolution in the structure of the profession	1	5

Source: Authors' work

Here are statements from participants supporting the sub-theme "would not affect the profession":

P6: "It will not have an effect for a long time. It might become a problem for guides later and could lead to unemployment. New business areas, such as themed tours, might be created."

P8: "It does not affect guides working with large tourist groups and tourist groups coming with agencies. I don't think it will either."



P10: "What people need is to be understood, felt, and loved. I don't believe a robot can perform this role with the same level of empathy and connection. Therefore, I don't think robot guides can be successful in this industry."

5. Discussion

The analysis of the data obtained in the study indicates that tourist guides actively benefit from technology in their profession. The most common technologies used among tourist guides include navigation applications, communication tools, and information-sharing platforms. These technologies are seen as valuable tools for reducing the likelihood of tourists getting lost and enhancing the efficiency of free time during tours.

The widespread use of technological devices profoundly impacts both tourists and the tourist guidance profession. Tourist guides frequently encounter situations where tourists have been exposed to information pollution on technological devices, leading them to question the guide's explanations and inquire about potentially incorrect information. Another significant finding from the interviews is that the profile of tourists has evolved with the prevalence of technological devices. Tourists now have easy access to information, conduct thorough research on their travel destinations in advance, possess a solid understanding of the tour programme's content and details, and often consider the recommendations of previous travellers on social media. Moreover, with the widespread use of technological devices, tourists increasingly embark on unguided journeys, relying on information-sharing platforms. Consequently, the consciousness level of tourists has transformed with the prevalence of technological devices, leading to a rise in self-guided travel. In response to these changes, tourist guides are encouraged to differentiate their professional expertise and tour programs to avoid the negative effects of technological devices. By incorporating technological device support into their tours, guides can adapt to the changing landscape and offer valuable services to tourists. This result of the present study aligns with the results of Zhang (2022), who emphasises the importance of guides adopting digital tools to safeguard their profession.

The study highlights a notable trend in the tourism industry: decreased sales of extra tour programmes and shopping opportunities offered by guides through agencies. This decline is attributed to the widespread use of technological devices, which enables tourists to explore and purchase alternative options online. Therefore, the reduction in sales for these additional tour programs and shopping opportunities, which typically contribute to the income of guides, is viewed negatively.

It has been suggested that guidance-based mobile applications, designed to cater to the individual needs of tourists and deliver informative content about their visited destinations, have not yet reached a stage where they can completely replace human tourist guides. However, these technologies are expected to impact the guiding profession significantly. While these technologies are not yet common, there are observations by tourist guides that such practices can lead to unguided tours and a slight decrease in the number of tour participants. These applications are anticipated to become more valuable for Generation Z and future generations, who are growing up in a technology-centric environment and may be more inclined to rely on technology for their travel needs. Consequently, there is a belief that these applications could eventually replace human guides. The results of this study are in line with the results of studies conducted by Bose et al. (2022), Webster & Ivanov (2022), and Samala et al. (2020), all of which indicate that robots may replace human guides in the future. On the other hand, Nazlı (2020) suggests that robots will not immediately impact the profession of guidance, while Sotohy (2020) firmly believes that robots will never replace humans in the profession.

When examining the views of tourist guides on robot guides, a prevalent perspective is that the development of robot features is essential for them to play an active role in the profession. It is argued that artificial intelligence technology needs further improvement to enable robot guides to serve as tourist guides effectively. Many participants expressed the view that current robot guides lack anthropomorphic features and emotional intelligence, which they consider essential for delivering quality guidance services. According to their perspectives, guiding involves analysing the tourists, tailoring information to their expectations, managing tour logistics, and even incorporating humour elements. Therefore, they believe that robot guides should possess anthropomorphic features and emotional intelligence.

In contrast to human guides who adapt to each tourist group's interests and socio-cultural background, organise tours accordingly, and adjust their narratives, there is a concern that robot guides may fall short in delivering personalised service. This aligns with the view expressed by Sotohy (2020), who also contended that robots cannot replace human interaction and activities in the guiding profession. Nonetheless, some viewpoints highlight various advantages of robot guides. These advantages include their ability to scan vast amounts of documents simultaneously using artificial intelligence technology, their competence in multiple fields, and their capacity to provide answers with the most up-to-date information. Additionally, robot guides are expected to contribute to the challenge of standardisation in the tourism industry, known for its labour-intensive nature. Using robot guides can help ensure that tourists receive consistent service across different tours, increasing customer satisfaction.

Furthermore, as technological advancements continue, it is anticipated that the cost of robot guides will decrease. Zhang (2022) supports this viewpoint by suggesting that robots will be instrumental in achieving service standardisation, enhancing customer



satisfaction, and reducing customer complaints in the future. Many tourist guides are open to working alongside robots with various features, such as emotional intelligence, mobility, and a focus on guest satisfaction. This collaborative approach is generally viewed positively. These guides believe that robot guides can help alleviate their workload and provide valuable support in situations requiring quick decisions. The prospect of human-robot cooperation is welcomed, as it is expected to enhance guest satisfaction by allowing tourist guides to allocate more time to interact with tourists. Working with robots is also seen as a way to make tour programs more interesting, potentially leading to increased promotional activities and tour participation. This result obtained from the current study aligns with the results of the study by Webster and Ivanov (2022), which suggests that tourists generally have positive attitudes toward robot guides. These robot guides are envisioned as playing a dual role in the profession, serving as information providers and guides with humanoid features.

5.1 Theoretical Implications

The study's findings show that technology is now used in the tourist guidance profession. The tourist profile has changed as a result of extensive technological use. Thanks to technological devices, tourists may now research destinations and activities independently and decide what to do without assistance from a tourist guide, including additional tours and shopping. Because of this, the tourist guide is unable to make further money. The rate at which technology is being used today has decreased the demand for tourist guides. Long-term effects of this predicament will be felt in the tourist guidance profession.

According to the literature, robot guides won't change the tourist guidance profession in the near future, but in the long run, they will take the place of humans. Tourist guides who participated in this research also believe that as robot guides acquire humanoid qualities, they will eventually be able to replace human guides. Collaborating with guide robots is embraced by tourist guides as it alleviates their responsibilities, allowing them to dedicate more time to attending to tourists while the robots handle basic informational tasks. According to research on employees across travel and tourism, employees have anticipated similar advantages from robots.

5.2 Practical Implications

To ensure that the tourist guidance profession remains unaffected by the use of technology, guides must be well-adapted to it. Tourist guides ought to utilise technology more often to get ahead of tourists. Due to widespread misconceptions, tourist guides are still reluctant to collaborate with robot guides. Although the tourist guidance profession is naturally flexible enough to adopt new technology, tourist guides can oppose advancement. The primary issue impacting the tourist guides' viewpoints of robot guides is their fear of the profession going extinct and consequent unemployment, even though they do not now regard it as an actual threat or possibility.

The use of robot guides may alter the duties of tourist guides, and as a result, there is currently a negative attitude against robot chefs in many areas. The tourist guidance profession will inevitably evolve, just like any other. In this instance, it is imperative to handle this transition in a way that protects the tourist guidance profession. It would, therefore, be advantageous for tourist guides to undergo instruction in the pertinent field. Tourist guides who worry about their job prospects in the future will be relieved when a facility is constructed that can be utilised by both human and robot guides. Robot guides should be designed as a bonus to help guides, and guides should be instructed on how to make good use of robot guides.

6. Conclusions

The study highlights that current perspectives on using robot technology as tourist guides are largely negative. However, it is believed that a more efficient approach can be achieved through collaboration with human guides. The findings suggest that while robot guide technology has the potential to replace human guides, certain qualities and capabilities need further development for robot guides to become effective substitutes. Some experts express concerns that evolving qualifications driven by technological advancements may lead to robots eventually replacing human guides, potentially contributing to unemployment issues in the profession. Therefore, it is evident that the tourist guidance profession may undergo significant changes in response to adopting robot technology.

It is important to acknowledge that this study had some limitations. The sample size was limited to 20 tourist guides. The results, therefore, may not be generalisable to the broader population of tourist guides. Additionally, gender, age, years of experience, and education level were not considered during the interviews, which could influence perceptions. As an academic contribution, this study aims to bridge the gap between technology and the tourist guidance profession, but further research is needed to gain a more comprehensive understanding of the evolving landscape. Future studies could explore the implications of robot guides within different contexts, including agencies or tourist guides of various nationalities. Investigating the perspectives of tourists from diverse backgrounds and their specific needs related to robot guide applications could provide valuable insights into the industry. Moreover, examining the effects of robots on the tourism sector and tourists and tourist guides in destinations where robot guides are actively used for guidance would contribute to the body of research in this field.



Furthermore, future research could delve into the attitudes of organisations like the Tourist Guides Association and member chambers towards robot guide applications. The interaction between robot guides and tourists and the impact of robot guides on the overall tourist experience is another promising area for investigation.

Credit author statement

All authors have contributed equally. All authors have read and agreed to the published version of the manuscript.

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