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How Will Artificial Intelligence Technologies and Service Robots Affect Tourism Jobs? A Narrative Literature Review[1]

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ABSTRACT

This study aims to examine the potential impacts of artificial intelligence and robots on occupations and employment in the tourism sector. In this study, a narrative approach is adopted by reviewing the literature and emphasizing the potential impacts on sub-fields in the tourism sector. The transformation of the tourism labor market is presented in this study under three main categories: (1) the accommodation sector, (2) the travel sector, and (3) the food and beverage sector. In the future, a significant transformation is expected to occur in these industries as artificial intelligence (AI)-supported robots become cheaper than human labor. AI-supported robots are expected to replace or work together with human labor in some areas. Three basic factors have been determined for service robots to replace humans in the industry: (1) Cost advantages offered by service robots, (2) improved operational capacities of robots, and (3) customer acceptance. The literature review reveals that there is a gap in how service robots can affect tourism employment and which jobs will be automated. This makes the study both original and important.

Keywords: Artificial intelligence, robots, workforce, technology, tourism.

Yapay Zekâ Teknolojileri ve Hizmet Robotları Turizm İşlerini Nasıl Etkileyecek? Anlatısal Literatür İncelemesi

ÖZET

Bu çalışmanın amacı, yapay zekâ ve robotların turizm sektöründeki meslekler ve istihdam üzerindeki potansiyel etkilerini incelemektir. Bu çalışmada literatür taraması yapılarak turizm sektöründeki alt alanlarda olası etkileri vurgulayan bir anlatısal yaklaşım benimsenmiştir. Turizm iş gücü pazarının dönüşümü, bu çalışmada üç ana kategori altında sunulmaktadır: (1) konaklama sektörü, (2) seyahat sektörü ve (3) yiyecek ve içecek sektörü. Gelecekte, yapay zekâ (YZ) destekli robotların insan iş gücünden daha ucuz hale gelmesiyle birlikte bu endüstrilerde önemli bir dönüşümün gerçekleşmesi beklenmektedir. YZ destekli robotların, bazı alanlarda insan iş gücünün yerini alması veya birlikte çalışması beklenmektedir. Hizmet robotlarının endüstride insanların yerine

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geçebilmesi için üç temel faktör belirlenmiştir: (1) Hizmet robotlarının sunduğu maliyet avantajları, (2) robotların geliştirilmiş operasyonel kapasiteleri ve (3) müşteri kabulü. Literatür taraması, hizmet robotlarının turizm istihdamını nasıl etkileyebileceği ve hangi işlerin otomatikleşeceği konusunda bir boşluk olduğunu ortaya koymaktadır. Bu durum çalışmayı hem orijinal hem de önemli kılmaktadır.

Anahtar Kelimeler: Yapay zekâ, robotlar, iş gücü, teknoloji, turizm.

1. INTRODUCTION

Artificial intelligence (AI) was introduced in 1956 following a speech by mathematics professor John McCarthy at the Dartmouth Conference about creating intelligent machines and robots. A group of scientists gathered for the Dartmouth Summer Research Project on Artificial Intelligence, planting the seeds of this idea (Rajaraman, 2014). Significant progress has been made over the last quarter-century. AI technology primarily focuses on mimicking human intelligence processes through computer systems. Machine learning and speech recognition are just two examples of AI technology (Ed Burns, 2021). AI is defined as "programs, algorithms, and machines that exhibit intelligence" (Shankar, 2018, p. 6). It is also described as a set of technologies capable of mimicking human intelligence in problem-solving (Lai and Hung, 2018). Many modern technologies are inspired by nature. For example, airplanes were designed by imitating birds' ability to fly. However, AI has also been identified as humanity's greatest potential threat (Musk, 2014).

The use of AI-supported systems in the tourism sector is becoming increasingly widespread. AI can help tourists find more relevant and accurate information for their vacation choices, enhance individuals' travel motivation, and provide a better tourism experience (Gretzel, 2011). Bowen and Morasan (2018) state that the hospitality sector faces a series of challenges, including labor shortages, an increase in the number of international travelers, and large volumes of consumer data, all of which can be addressed through AI-supported technologies. Buhalis et al. (2019) emphasize that AI-powered technologies can be utilized in business processes. Currently, revenue management systems used in hotel operations process big data to assist managers in making strategic decisions (Çıvak et al., 2017). However, the question of what the future holds for this era of machine-human collaboration remains a topic of curiosity.

The integration of robots into services represents a significant shift in both business processes and mindset (Saputra et al., 2024). However, the replacement of human labor by AI and robots in the tourism sector introduces several challenges (Zlotowski et al., 2015). While it facilitates faster, more accurate, and less labor-intensive operations, it also poses a threat to the employment of millions of workers in the tourism industry. Additionally, it has the potential to reduce the human interactions that distinguish the tourism sector from others, weaken human-centered hospitality values (Choi et al., 2020), and lead to the commodification of the service process.

Other studies in the tourism and hospitality literature have focused on topics such as literature reviews on AI, robots, and smart systems (Saputra et al., 2024; Knani et al., 2022; Saydam

et al., 2022), technology acceptance (Zhang and Jin, 2023), and the use of service robots (Harris et al., 2018; Bowen and Morosan, 2018; Mende et al., 2019; Curtis, 2016; Nguyen, 2016; Khan, 2017; Pierce, 2017). While the potential for robots and AI to replace human labor is frequently discussed, studies specifically addressing which areas of employment in the tourism sector are likely to be affected remain limited. Discussions about the impact of AI on tourism need to continue. Murphy et al. (2017) identified research areas that include the use of robots in tourism and hospitality, one of which examines the effects of AI and robots replacing human labor. This study aims to leverage existing literature to identify which areas of the tourism sector are most likely to experience changes in the workforce due to AI-supported software and service robots. For this purpose, a thorough review of the tourism and hospitality literature has been conducted to draw meaningful insights. This study is expected to serve as a valuable resource for academic scholarship, managerial knowledge, and policymakers.

1. LITERATURE REVIEW

1.1. Artificial Intelligence Applications and Service Robots

Employees are an integral part of the service, and people seek face-to-face communication. However, with advancing technology, a paradigm shift is inevitable (Bowen and Morosan, 2018). Technological advancements are seen to bring about disruption and creative destruction in service processes. The development of AI-supported service robots is likely to impact efficiency, costs, workforce, service quality, ethical and social conditions, and training programs in the sector. Integrating human-like features into smart robots is being considered to facilitate user acceptance and usage. Kuhne and Peter (2003) argue that personalization through human traits can help create positive perceptions of robots among customers. However, while human-like characteristics are generally appealing, an excessive resemblance can evoke discomfort (Bartneck et al., 2007). Despite this, advancements in the field are progressing at a dizzying pace.

The literature indicates that AI robots can be categorized into two main types: software-based and hardware-based robots. Software-based robots include virtual assistants and chatbots, while hardware-based robots refer to physical entities, whether humanoid or non-humanoid (Saputra et al., 2024). The International Organization for Standardization (ISO) classifies robots into two primary categories: industrial robots and service robots (iso.org, 2012). Service robots can further be subdivided. Saputra et al. (2024) offer a comprehensive typology of AI robots used in tourism and hospitality, categorizing them into four types: chatbots, mechanoids, humanoids, and android robots. AI-powered chatbots, commonly used today, provide significant convenience for businesses and customers. Chatbots are AI-driven programs designed to provide information, answer questions, or interact with users. They play a critical role in customer service, providing information, offering product recommendations, guiding users, and automating tasks. Mechanoids, on the other hand, are robotic systems capable of performing physical tasks. These robots are utilized across various industries, including transporting and assembling items on factory production lines,

executing dangerous tasks, supporting military operations (surveillance, logistics), planting and harvesting in agriculture, and more recently, performing household chores.

Humanoid robots enable the integration of human cognitive abilities and expertise with the physical capabilities of humanoid robots. It is anticipated that humanoid service robots will increasingly replace human service providers in various sectors (Harris et al., 2018). Some traditional functions in tourism, such as hotel receptions, could disappear (Bowen and Morosan, 2018), as the emergence of humanoid robots represents one of the most dramatic evolutions in the service industry, a process that is already ongoing (Mende et al., 2019). In the sector, there are service robots performing tasks such as making pizzas, serving as waiters, and working as baristas (Curtis, 2016; Nguyen, 2016; Khan, 2017; Pierce, 2017). Many of these robots are semi-humanoid robots, such as Pepper, produced by SoftBank Robotics, and are designed with the ability to read emotions (SoftBank Robotics, 2024).

Android robots have a human-like physical structure and, in some cases, software systems that can mimic human behaviors. They are used in various fields and are becoming increasingly common. One of the critical aspects of this area is the adoption rate by individual and institutional users (Bowen and Morosan, 2018). This is particularly relevant in the tourism sector, which is labor-intensive, as consumers' acceptance of human-free services raises important questions.

1.2. Possible Effects of Technological Transformation on Employment in the Tourism Industry

Technological developments contribute to better service delivery in the tourism sector (Buhalis and Amaranggana, 2013). Acceleration of the workflow, strengthening of communication, and elimination of possible errors are important contributions. Tourism businesses benefit from automation systems, mobile applications, and service robots to meet customer expectations and provide a better experience (Ivanov et al., 2017). Although these developments have provided significant improvements over the years, they have also eliminated some professions. For example, the liftboy profession in hotels disappeared after the technological developments in elevators. Similarly, people who work as pageboys are no longer needed. It is anticipated that AI applications and service robots, which have developed especially in the last quarter-century, will create a significant change in the tourism sector. According to Ivanov (2017), a wide-scale integration of robots is expected in both consumer and industrial areas within 15-20 years. Of course, this transformation will be parallel to the speed of development of technology.

The hotel industry has begun to adopt service robots, which are considered the workforce of the future, but the services provided by humans are perceived to be higher than those of service robots in terms of interaction quality and physical service environment (Choi et al., 2020). Of course, the perception of quality may also change with the development of technology. Thus, new technologies can be established in business processes. Service robots are initially expected to perform standardized tasks due to social/emotional and cognitive/analytical complexity (Resete et al., 2020). Therefore, people working in simple

and routine jobs seem to be more likely to be unemployed at this point. For example, Hotellinkage create RecepAI. RecepAI is an artificial intelligence-powered digital receptionist developed for hotels. The system was developed to automate operations and reduce workload. In addition, the company aims to provide a significant relief in workload by developing a virtual concierge service (hotellinkage, 2025). Although all these developments seem good, they have the potential to create a complex environment for the labor market.

Since the Industrial Revolution, machines have been used to simplify tasks, increase production, and reduce costs, gradually replacing human labor. While machines have traditionally been used for simple and routine tasks, AI-supported technologies are now capable of competing with humans in almost every job, signaling risks for the tourism sector (Bulchand-Gidumal, 2022). Predictions suggest that by 2030, the workforce in the hospitality industry may shrink by 25% (Bowen and Morosan, 2018). This sudden shift in the tourism sector will bring challenges along with its benefits. Bowen and Morosan (2018) foresee a disruptive paradigm shift where robots and AI will help create successful hospitality companies while leaving many tourism workers unemployed.

The widespread adoption of humanoid robots and their use in the service sector hints at their growing presence in the hospitality industry in the future. In particular, tasks such as taking and preparing food and beverage orders, handling check-ins/check-outs, and recording guest requests, complaints, and demands are areas where these robots are expected to be initially deployed. In some restaurants, robots have been designated to perform specific tasks, effectively replacing humans. For example, Caliburger has developed a robot that can cook hamburgers, detect when they are done, place them on a tray, and serve them (Graham, 2018). Robot baristas have been created to fulfill customers' coffee orders (Pierce, 2017). Compared to typical industrial production robots, service robots are notable for their mobility, the flexibility of tasks they can perform, and, most importantly, their ability to facilitate human-machine interactions. Service robots are also being utilized in cleaning tasks. The biggest advantage of service robots is their ability to handle standard, repetitive, and monotonous tasks (SoftBank Robotics, 2024). In the hospitality sector, AI-powered machines could take over jobs in service areas that operate like a factory assembly line. This could provide an opportunity for the development of hotel workers who are de-skilled and devalued (Çıvak and Besler, 2022). However, it remains an important research question of how skilled jobs may evolve in response to rapidly advancing technologies.

There have always been significant transformations in the sub-sectors of tourism, from the hotel industry to the travel industry, and from the food and beverage industry to the entertainment industry. The changes in technological breakthroughs in the last quarter century are revolutionary rather than evolutionary. For example, the tourist guide profession, which has a history of hundreds of years, is affected by this transformation. Respectively, microphone headsets, audio guide applications, virtual tours with simulations, and finally robot guides are technological developments in the field (Kavak and Emir, 2023, 3057). The development of robot guides has been continuing for the last 20 years (Lin et al., 2024) and

threatens the existence of this profession. Robot guides are effectively used in structures such as museums, fairs, and exhibition halls (Matsumoto et al, 2021). It is seen that the most common area of use is museums. The American Museum of Natural History, the Meaux War Museum, and the Canadian Museum of Science and Technology are some of the museums where robot guides are used (Sotohy, 2020). In addition, a robot guide called RoBoHon is used on field trips (Düz, 2024).

As mentioned before, technological transformations provide increased efficiency and productivity in business processes, while their effects on employment can be both positive and negative. It is emphasized that the displacement effect created by artificial intelligence on employment causes job losses; however, its complementary and creative effects create new job areas and contribute positively to employment (Zhou et al., 2019; Ivanov, 2017). Çolak (2023) argues that artificial intelligence will create fifteen new job positions in the tourism sector. These roles include AI tour experience designers, AI travel advisors, AI-supported destination managers, AI ethics specialists, and fairness officers, AI-driven sustainability consultants, AI-assisted cultural ambassadors, AI-guided accessibility coordinators, AI tourism innovators, AI-based customer engagement experts, AI tourism data analysts, AI-supported event planners, AI-integrated travel journalists, AI-backed gastronomy innovators, AI-assisted tourism trainers, and AI tourism data privacy officers. The findings of the study conducted by Çolak (2023) are based on findings produced by artificial intelligence. Of course, these results are open to debate.

Kumar et al. (2021), in their literature review on the use of AI and robotics, state that hotels will be fully automated using self-service tools and robotic technology. Similar developments are expected in the food and beverage sector. Rosete et al. (2020) state that service robots can perform standardized tasks due to social/emotional and cognitive/analytical complexity. They state that in the future, organizations will have to decide whether AI will allow humans to be completely replaced by robots that can perform the necessary cognitive and emotional tasks. Limma (2023) states in the narrative synthesis that AI technologies have both positive and negative effects on the workforce and employment in the hospitality sector. While the literature generally sees acceleration in workflow and reduction of workload as positive, job losses are seen as negative aspects. However, the majority of studies in the literature focus on technology acceptance. Oğan (2024) states that articles on service robots mostly focus on people's attitudes and acceptance of these services. Therefore, this study can contribute to labor studies and the shaping of labor policies of countries.

2. METHOD

The number of studies published on service robots and artificial intelligence in tourism literature is steadily increasing, indicating that the topic is gaining importance and attention within academic circles. This study has conducted a thorough literature review to explore the potential impacts of AI and service robots on various subfields of the tourism sector. Literature reviews can generally be categorized as either "systematic" or "narrative" (Byrne,

2016). This study adopts a narrative approach to draw inferences in line with the research's purpose and scope. Narrative literature reviews are studies that define and discuss a specific topic or theme from a theoretical and contextual perspective (Rother, 2007), and they are also referred to as non-systematic literature reviews. Narrative reviews provide a comprehensive synthesis of previously published information (Green, Johnson et al., 2006). Accordingly, this study presents a synthesis of the literature focusing on the impact of artificial intelligence and service robots on the labor market.

In this study, research steps for the narrative review were developed. During the review process, the studies of Baumester and Leary (1997), Byrne (2016), and Ferrari (2015) on how to write narrative literature were taken as reference, and the review was carried out accordingly. Initially, a database was selected for the review. Google Scholar was chosen as the database due to its vast number of included studies, which sets it apart from other databases. Subsequently, the search terms "artificial intelligence," "robot," and "service robots" were entered as separate search parameters. Studies that included these terms in their titles or texts were thoroughly examined. Studies where these concepts appeared only sporadically were excluded according to the exclusion criteria. The same key terms were searched in combination with other terms such as "tourism," "hospitality," "service," "hotel," "travel," and "food and beverage." For instance, the terms "service robots" and "hotel" were entered into the advanced search parameters. Various combinations of these key terms were also used for further searches. Studies to be included or excluded were reviewed following defined procedures. Exclusion criteria were applied to inaccessible studies that had incomplete information or contained content outside the scope of the research question. All studies are included up to 2025.

Fig 1. Review Process of Studies

In qualitative research, credibility is crucial. Various strategies can be employed to enhance the reliability/credibility of the research (Lincoln and Guba, 1985). In this study, relevant works were archived and examined repeatedly. The research findings and results, in particular, were reviewed meticulously. Additionally, this research was reviewed by three individuals independent of the researcher: two academics specializing in tourism and technology, and one expert in tourism economics. The researcher discussed the findings and results with each of the experts individually. A comparison was made between the results and how well they aligned with the literature and the expert opinions.

3. FINDINGS AND DISCUSSION

The studies were examined and analyzed the statements, findings, results and implications regarding the impacts on the workforce, labor market and business processes. Thematic analysis was adopted. Studies were grouped accordingly, and the transformation of the tourism labor market was addressed under three main categories: (1) accommodation sector, (2) travel sector, and (3) food and beverage sector. Changes in business processes in each area, potential future changes and impacts on the workforce were discussed. Thus, by filtering the sources in the literature, important inferences were obtained about how tourism jobs and workers will be affected in the future.

3.1. Impact on Employment in the Hotel Industry

Many hospitality businesses have been investing more in technology in recent years to increase their revenue and growth (Loureiro et al., 2021). The hospitality sector has begun to benefit from technologies in the fields of artificial intelligence, robotics, and big data (Reis et al., 2020). We can observe this situation, especially in the development of smart hotels (Ruel and Njoku, 2021). The main reasons why companies switch to these smart technologies are to improve operational processes, reduce costs, improve customer experiences, and provide new experiences (Mingotto et al., 2021). Personnel costs will be reduced thanks to technological advances. It is also stated that possible theft cases can be reduced by control mechanisms through technology (Berezina et al., 2019). However, control mechanisms will create a panopticon effect. Çıvak and Besler (2022) state that personnel monitoring mechanisms create a panopticon effect and turn into a pressure practice.

Reservation engines on hotel websites have become an essential tool for hotels. They are preferred because they offer cost and labor advantages to hotels. Additionally, they have the potential to increase customer satisfaction by providing 24/7 service. It is predicted that in the future, as AI-supported robots become less expensive than human labor, tasks such as reservations, travel planning, hotel check-in/check-out processes, payment transactions, and switchboard operations will be automated, moving away from human labor. Furthermore, it is expected that AI-supported robots in the hospitality industry will automate many services, such as providing information, answering questions, interacting with users, taking orders, and serving, ultimately reducing the need for human involvement in certain tasks (Harris et al., 2018; Curtis, 2016; Nguyen, 2016; Khan, 2017; Pierce, 2017; Saputra et al., 2024). For example, revenue management systems are used to manage big data and make strategic decisions. These systems provide significant support to managers in making strategic decisions. While in the past, storing, processing, and making customer data ready for analysis was a huge workload, now we have entered a period where strategic decisions can be made more easily thanks to these artificial intelligence-supported systems (Çıvak et al., 2017).

It is seen that smart hotels are becoming widespread in the hotel industry and service robots are now being used. Artificial intelligence-supported service robots are reshaping the service concept. It is stated that artificial intelligence-supported systems and service robots in the

hotel industry or service field will develop as they take on more analytical tasks and reach a position where they can imitate human behavior from analytical level to intuitive and empathic skills (Huang and Rust, 2018). In the last few centuries, mechanization and robotic development have caused a job change in the manufacturing industry and shifted towards the service industry (Buera and Kaboski 2012). This situation is experienced in an area where it is thought that humans cannot be isolated from the service industry and has the potential to cause many hotel employees to lose their jobs and customers to lose the chance to receive service from humans. Unequal relations between the receiver and the provider of service (Çıvak, 2021) also have the potential to disappear thanks to service robots. However, unemployment can cause much deeper sociological consequences than this.

The development of AI-supported systems and service robots brings with it the loss of low-tech jobs, significant security issues, and privacy concerns (Tussyadiah, 2020). Especially in hotel businesses, where communication between employees is dynamic, the weakness of communication between robots creates concerns about employee and customer security and privacy. Alongside all these advancements, a significant question regarding technology adoption remains: How do both customers and hotel employees view high-tech solutions? Zhang and Jin (2023) highlight that hotel employees have developed a negative awareness of service technologies (STAARA), which has led to increased job insecurity and a tendency to switch jobs. Similarly, Parvez et al. (2022) found that employees' awareness of the adoption and use of service robots significantly affects their perceptions of robot-induced unemployment. In particular, entry-level employees perceive the risk of unemployment to be higher compared to managers. This situation may have a negative impact on future intentions to enter the tourism sector. If potential workers' intentions to join the sector decrease, the problem of qualified labor shortages may grow.

3.2. Impact on Employment in the Travel Industry

Artificial intelligence is used in almost every field of travel and tourism today. Various applications such as personalization and recommendation systems, robots, voice assistants, smart travel agencies, forecasting and prediction tools, language translation applications, and voice recognition and natural language processing technologies stand out in this field (Bulchand-Gidumal, 2022). Many industries have been transformed through the use of chatbots, changing the way business is conducted. One of the first sectors affected by technological developments is the travel industry. Advancements in transportation, reservation systems used by travel agencies, and voice guides are just a few examples of technological innovations in this field. The rise of online travel agencies and the automation of the booking process were the first steps in this transformation.

In the tourism sector, AI-based chatbots are increasingly used, especially in the travel and booking stages (FlowXO, 2020). AI-powered chatbots provide essential services for users, including travel planning, ticket booking, emergency assistance, and travel recommendations (Pillai and Sivathanu, 2020). Moreover, the development of robot guides is becoming evident. Düz (2024) discusses the experiences of a traveler using a robot guide, revealing

several negative aspects, such as high prices, uncomfortable design, poor communication with the user, limited content delivery, and low performance in various conditions. However, as the development of travel robots continues, it is possible to believe that these negative experiences could eventually turn into positive ones. The question of whether the tour guiding profession will be elevated with technology or will be replaced by robot guides is both an important curiosity and a concern. Robot guide technology, which has been developing for the last 20 years (Lin et al., 2024), is currently used effectively in many different areas of the world, especially in structures such as museums, fairs, and exhibition halls (Matsumoto et al., 2021). It is possible to say that the closer the location, directions, field trips, and storytelling come to the transmission of human guides, the easier the acceptance of technology will be. It is currently seen that this technology is in a transition period in the field of tour guiding. With developing technology, predictions of the profession will be more clearly shaped.

Airline companies have significantly eased workflow in-ground services through online check-in. In the coming years, it seems that processes such as passport control and baggage claim will also be automated. The growth of online agencies, the full integration of chatbots in travel planning, and more advanced versions of robot guides, both in terms of hardware and software, are expected to reduce the need for human involvement in these processes.

3.3. Impact on Employment in the Food and Beverage Industry

Developments in artificial intelligence have reached a preferable quality in terms of productivity in the food and beverage sector. Food production facilities use artificial intelligence to automatically separate, clean, and dispose of products such as fruits and vegetables. In addition, food and beverage production optimization provides significant advantages in areas such as safety/quality, hygiene, maintenance, waste reduction, environmental sustainability, and packaging (de Oliveira et al., 2022). Although these sections are more in industrial production, they can be used in hotels and restaurants in terms of food safety, waste reduction, and efficiency. Artificial intelligence is successfully used in many sections such as suggestion and recommendation engines, chatbots, robots, kiosks, integrated purchasing and inventory, biometrics, etc. in restaurants (Dani et al., 2022).

The advent of AI job displacement first occurs for mechanical tasks, analytical tasks, then intuitive tasks, and empathic tasks (Huang and Rust, 2018). There are examples of transformation in the food and beverage field. These first cover mechanical tasks. The use of service robots in pizza, hamburger, and coffee shops (Curtis, 2016; Nguyen, 2016; Khan, 2017; Pierce, 2017), along with the development and implementation of smart cooking technologies, demonstrates that this trend will likely expand in the future (Güngör and Güngör, 2024). Robot technologies in the food and beverage industry now work as waiters and cooks. In many countries, robot-based service flow, smart cooking environments, self-regulating ovens, and personalized recipe suggestion systems are being designed. These innovations not only provide convenience but also encourage sustainable practices by minimizing food waste (Kaur et al., 2024). However, as mentioned before, they also threaten

employment in this field. In addition, important questions arise about the impact of technology in developing or eliminating human capabilities in a field where talent and creativity are present.

Ivanov and Webster (2023) state that the public is hesitant to accept robots to perform a certain task such as cooking. The main reasons for this may be that cooking is specific to humans, there may be a widespread belief that it requires some kind of spiritual/artistic element, and there may be a cult of chefs. They believe that delicious food can be provided by service robots that make presentations fun and customer acceptance can be achieved. With this, Kokkinou and Cranage (2015) indicate that customers become more motivated to use self-service technologies as the waiting time increases for service employees. This trend suggests that in the future, self-service areas will become more widespread across various sectors. Thus, it is obvious that there will be a transformation in the food and beverage industry.

4. CONCLUSION AND RECOMMENDATION

In the service sector, the use of robot technology for self-service provides new ways to interact with customers. It is particularly useful in standardizing the service process. Three key factors must be met for service robots to replace human workers in the sector. Firstly, service robots must offer cost advantages, secondly, their capabilities must improve, and thirdly, customer acceptance must be achieved. Once these three components are in place, technological transformation in many job sectors seems inevitable. It can be stated that humanization in all levels of tourism services will not be possible soon, and technological developments will lead to a division of labor between the workforce and robots (Kömürcü et al., 2021). Particularly, it is likely that AI-driven automation programs and service robots will replace standard, routine, and simple jobs.

In the hospitality industry, transformations in tasks such as check-in/check-out, invoice receipt, ordering, baggage services, and cleaning of common areas are expected to occur sooner. In the travel sector, it is possible that reservation systems will move beyond human operator control soon. By the second half of this era, robot guides could take over the profession of tour guides. Additionally, as smart cooking and service robots evolve in the food and beverage industry, the need for human workers in this sector will likely decrease.

The entry of AI and service robots into the tourism sector is seen as a potential threat to many tourism employees' future careers, which may lead to decreased focus and motivation at work. Three different perspectives on the impact of AI on the workforce have emerged: the optimistic view (e.g., new jobs, increased human value), the pessimistic view (e.g., unemployment, technology controlling humans, increased societal polarization), and the neutral view (e.g., still too early). A common conclusion in the literature is that AI is still an evolving technology, and its future development will remain in human hands (Yeh et al., 2020).

Huang and Rust (2018) define four types of intelligence involved in performing service tasks. Accordingly, they classify them as mechanical, analytical, intuitive, and empathic. Based on this classification, an inference was made in this study about which professions the types of artificial intelligence could affect. This inference is presented in Table 1. For example, it is stated that mechanical robots can perform simple, standard, repetitive, regular, and precise tasks. The job characteristics suitable for these jobs are determined, and it is conveyed which jobs in the field of hospitality will be affected.

Table 1. The Nature, Characteristics, and Job-Changing Potential of Artificial Intelligence in the Tourism Industry

Artificial Intelligence	Features of Jobs in Tourism	Jobs in Tourism
Mechanical	Check-in and check-out procedures	Receptionist
Simple, standard, repetitive, regular, and precise tasks	Welcoming	Bellboy - doorman
Self-service technologies	Ordering	Waiter
	Making reservations	Reservation staff
Analytics	Data analysis	Travel planning assistants
Analyzing and learning based on data	Forecasting	Data analysts
Making decisions and providing support	Determining pricing policies	Revenue managers
	Making strategic decisions	Front office managers and assistants
		Sales and marketing personnel
		Senior executives
Heuristic	Reporting	Senior managers
Intuitive learning based on understanding	Data interpretation	Security personnel
Deep learning based on artificial neural networks	Creating a narrative	
Empathic	Thinking and feeling like a human	Tour guides
Learning and adapting empathically based on experience	Negotiating	Customer relations
Recognizing emotions, communicating, and making decisions		All frontline employees

Depending on the nature of the job, each job requires different levels of intelligence. Technology will have a greater say in the future in performing a range of jobs from simple, routine, and standard jobs to complex ones. Chatbots, mechanoids, humanoids, and android robots, as categorized by Saputra et al. (2024), are still evolving. As the levels of intelligence defined by Huang and Rust (2018) are transferred to service robots and become more functional, human-machine collaboration and then job change will likely occur in many areas of the service sector.

This research raises important questions regarding the potential impacts of AI-powered software and service robots on the workforce within the tourism sector, signaling a new avenue for field research for scholars. Unlike previous studies in the literature that focus on

technology acceptance, the effects of artificial intelligence, and the operational principles of service robots, this study examines how these technologies might affect work processes and employment in various subfields of the tourism industry. Given that this study is one of the first to highlight the impacts on the tourism workforce, it could make a significant contribution to the literature.

As the costs of AI-powered robots decrease and fall below the cost of human labor, it can be said that businesses may transition to these systems for cost advantages. In the future, businesses that implement service robots and systems will likely thrive, while others may struggle to compete. This shift could drive a new wave of innovation and efficiency in the service industry, but also present significant challenges for businesses that are slow to adapt.

Tourism is a sector that provides job opportunities for both skilled and unskilled workers. It plays a crucial role in reducing unemployment. However, the implementation of AI-powered software and service robots, which could replace human workers, requires thorough evaluation. Job losses could lead to the creation of an unemployed workforce, making the situation increasingly difficult to manage. Therefore, it is essential to carefully monitor the impact of mechanization, not only in the tourism sector but across all industries. Policymakers are encouraged to develop potential scenarios and make future plans to ensure that the transition balances technological progress with the well-being of workers.

The primary limitation of this study is the absence of field research. However, the richness of secondary data has allowed for insights into the future of the tourism sector. This study raises important questions for future research: (1) If service robots become widespread in the tourism industry, which sectors will unemployed tourism workers shift to? (2) How will robotization/mechanization impact vocation prices in the tourism sector? (3) If robotization becomes widespread in the future, how will purchasing behavior in the tourism sector be affected? These complex questions are significant in uncovering the supply-demand balance and the trajectory of employment in the tourism sector.

Statement of Research and Publication Ethics

In all processes of the article, the principles of research and publication ethics of the Manisa Celal Bayar University Journal of Social Sciences Institute were followed.

Authors' Contribution Rates to the Article

The entire article was written by the author.

Statement of Interest

The author has no conflict of interest with any person or organization.

REFERENCES

Bartneck, C., Kanda, T., Ishiguro, H., & Hagita, N. (2007, August). Is the uncanny valley an uncanny cliff?. In *RO-MAN 2007-The 16th IEEE international symposium on robot and human interactive communication* (pp. 368-373). IEEE. https://doi.org/10.1109/ROMAN.2007.4415111

Baumeister, R. F., & Leary, M. R. (1997). Writing narrative literature reviews. *Review of general psychology*, *1*(3), 311-320. https://doi.org/10.1037/1089-2680.1.3.311

Berezina, K., Ciftci, O., & Cobanoglu, C. (2019). Robots, artificial intelligence, and service automation in restaurants. In *Robots, artificial intelligence, and service automation in travel, tourism and hospitality* (pp. 185-219). Emerald Publishing Limited. https://doi.org/10.1108/978-1-78756-687-320191010

Bowen, J., & Morosan, C. (2018). Beware hospitality industry: the robots are coming. *Worldwide Hospitality and Tourism Themes*, *10*(6), 726-733. https://doi.org/10.1108/WHATT-07-2018-0045

Buera, F. J., & Kaboski, J. P. (2012). The rise of the service economy. *American Economic Review*, *102*(6), 2540-2569. https://doi.org/10.1257/aer.102.6.2540

Buhalis, D., & Amaranggana, A. (2013). Smart tourism destinations. In *Information and communication technologies in tourism 2014: Proceedings of the international conference in Dublin, Ireland, January 21-24, 2014* (pp. 553-564). Springer International Publishing. https://doi.org/10.1007/978-3-319-03973-2_40

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

Bulchand-Gidumal, J. (2022). Impact of artificial intelligence in travel, tourism, and hospitality. In *Handbook of e-Tourism* (pp. 1943-1962). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-030-48652-5_110

Byrne, J. A. (2016). Improving the peer review of narrative literature reviews. *Research integrity and peer review*, *1*, 1-4. https://doi.org/10.1186/s41073-016-0019-2

Choi, Y., Choi, M., Oh, M., & Kim, S. (2020). Service robots in hotels: understanding the service quality perceptions of human-robot interaction. *Journal of Hospitality Marketing & Management*, *29*(6), 613-635. https://doi.org/10.1080/19368623.2020.1703871

Çıvak, B. (2021). *Otel işletmelerinde emek sömürüsü, tahakküm ve direniş ilişkilerine dair niteliksel bir araştırma* [A qualitative research on relations of labor exploitation, domination and resistance in hotel businesses]. [Doctoral Dissertation]. Anadolu University.

Çıvak, B., & Besler, S. (2022). A Critical Analysis of Managerial Control Mechanisms in Hotel Businesses. *SAGE Open*, *12*(1), https://doi.org/10.1177/21582440221088850

Çıvak, B., Kaya, E., & Emeksiz, M. (2017). Online distribution channels and yield management in the hotel industry. In *Routledge Handbook of Hospitality Marketing* (pp. 210-223). Routledge. https://doi.org/10.4324/9781315445526-17

Curtis, S. (2016). Pizza Hut hires ROBOT waiters to take orders and process payments at its fast-food restaurants. *Mirror. Retrieved on January 4*, 2025.

Dani, R., Rawal, Y. S., Bagchi, P., & Khan, M. (2022, November). Opportunities and challenges in implementation of artificial intelligence in food & beverage service industry. In *AIP Conference Proceedings* (Vol. 2481, No. 1). AIP Publishing. https://doi.org/10.1063/5.0103741

de Oliveira, R. O., Coppola, M., & Vermesan, O. (2022). AI in Food and Beverage Industry. In *Artificial Intelligence for Digitising Industry–Applications* (pp. 251-259). River Publishers. https://doi.org/10.1201/9781003337232-22

Düz, B. (2024). Robot Turist Rehberi ile Gezmek Nasıl Bir Şey? RoBoHoN'a İlişkin Kullanıcı Deneyimi Üzerine Bir Söylem Analizi. *Anadolu Üniversitesi Sosyal Bilimler Dergisi*, *24*(2), 769-796. https://doi.org/10.18037/ausbd.1452072

Ed Burns, E. L. (2021). What is artificial intelligence? available at: searchenterpriseai.techtarget.com:https://searchenterpriseai.techtarget. com/definition/AI-Artificial-Intelligence

Ferrari, R. (2015). Writing narrative style literature reviews. *Medical writing*, *24*(4), 230-235. https://doi.org/10.1179/2047480615Z.000000000329

FlowXO. (2020). What industry are using chatbots today?. available at: https://flowxo.com/what-industries-are-using-chatbots-today/

Graham, J. (2018). Hamburger-making robot Flippy is back at Calif. Chain. *USA Today,* available at: https://www. usatoday. com/story/tech/talkingtech/2018/05/28/hamburger-makingrobot-flippy-back-serving-300-burgers.

Green, B. N., Johnson, C. D., & Adams, A. (2006). Writing narrative literature reviews for peer-reviewed journals: secrets of the trade. *Journal of chiropractic medicine*, *5*(3), 101-117. https://doi.org/10.1016/S0899-3467(07)60142-6

Gretzel, U. (2011). Intelligent systems in tourism: A social science perspective. *Annals of tourism research*, *38*(3), 757-779. https://doi.org/10.1016/j.annals.2011.04.014

Harris, K., Kimson, A., & Schwedel, A. (2018). Why the automation boom could be followed by a bust. *Harvard Business Review*, *13*.

Hotellinkage. (2025). RecepAI. https://www.hotellinkage.com/tr/recepai

Huang, M. H. & Rust, R. T. (2018). Artificial intelligence in service. *Journal of service research*, *21*(2), 155-172. https://doi.org/10.1177/1094670517752459

iso.org. (2012). Online Browsing Platform (OBP). available at: https://www.iso.org: https://www.iso.org/obp/ui/#iso:std:iso:8373:ed2:v1:en

Ivanov, S. (2017). Robonomics – principles, benefits, challenges, solutions. *Yearbook Of Varna University Of Management, 10*, 283-293.

Ivanov, S. H., Webster, C., & Berezina, K. (2017). Adoption of robots and service automation by tourism and hospitality companies. *Revista Turismo & Desenvolvimento*, *27*(28), 1501-1517.

Ivanov, S., & Webster, C. (2023). Restaurants and robots: public preferences for robot food and beverage services. *Journal of Tourism Futures*, *9*(2), 229-239. https://doi.org/10.1108/JTF-12-2021-0264

Kahn, J. (2017). Domino's will begin using robots to deliver pizzas in Europe. *Bloomberg,* available at: https://www. bloom berg. com/news/articles/2017-03-29/domino-s-will-begin-usingrobots-to-deliver-pizzas-in-europe.

Kaur, K., Kaur, J., & Singh, R. Emerging Technologies in Food and Beverage Industry: From Smart Kitchens to Food Delivery Innovations. *AI, Blockchain, and Metaverse in Hospitality and Tourism Industry 4.0*, 263-276. https://doi.org/10.1201/9781032706474-18

Kavak, M., & Emir, O. (2023). Turist Rehberliği Alanındaki Ön Lisans, Lisans ve Lisansüstü Programların Müfredatının Teknoloji ve Dijitalleşme Açısından İncelenmesi (Investigation of the Curriculum of Associate, Undergraduate and Graduate Programs in the Field of Tour Guiding in terms. *Journal of Tourism & Gastronomy Studies*, *11*(4), 3055-3076. https://doi.org/10.21325/jotags.2024.1331

Knani, M., Echchakoui, S., & Ladhari, R. (2022). Artificial intelligence in tourism and hospitality: Bibliometric analysis and research agenda. *International Journal of Hospitality Management*, *107*, 103317. https://doi.org/10.1016/j.ijhm.2022.103317

Kokkinou, A., & Cranage, D. A. (2015). Why wait? Impact of waiting lines on self-service technology use. *International Journal of Contemporary Hospitality Management*, *27*(6), 1181-1197. https://doi.org/10.1108/IJCHM-12-2013-0578

Kömürcü, S., Ertamay, S. İ., & Güler, M. E. (2021). Impacts of technological development on employment structure of tourism industry. *Journal of Management and Economics Research*, *19*(1), 146-165. https://doi.org/10.11611/yead.814765

Kumar, S., Kumar, V., & Attri, K. (2021). Impact of artificial intelligence and service robots in tourism and hospitality sector: current use & future trends. *Administrative Development: A Journal of HIPA, Shimla*, *8*(SI-1), 59-83. https://doi.org/10.53338/ADHIPA2021.V08.Si01.04

Kühne, R., & Peter, J. (2023). Anthropomorphism in human–robot interactions: a multidimensional conceptualization. *Communication Theory*, *33*(1), 42-52. https://doi.org/10.1093/ct/qtac020

Lai, W. C. and Hung, W.H. (2018). A framework of cloud and AI based intelligent hotel, Proceedings of the 18th international conference on electronic business, ICEB, Guilin, 2–6 December.

Limna, P. (2023). Artificial Intelligence (AI) in the hospitality industry: A review article. *International Journal of Computing Sciences Research*, *7*, 1306-1317.

Lin, Y., Jo, W., Ali, A., Robert Jr, L. P., & Tilbury, D. M. (2024, March). Toward Personalized Tour-Guide

Robot: Adaptive Content Planner based on Visitor's Engagement. In *Companion of the 2024 ACM/IEEE International Conference on Human-Robot Interaction* (pp. 674-678). https://doi.org/10.1145/3610978.3640731

Lincoln, Y.S. & E. G. Guba. 1985. *Naturalistic inquiry.* Sage, Newbury Park. https://doi.org/10.1016/0147-1767(85)90062-8

Loureiro, S. M. C., Ashfaq, M., & Rodrigues, M. O. B. (2021). AI Meaning and Applications in the Consumer Sector of Retailing, Hospitality, and Tourism. In *Handbook of Research on Applied Data Science and Artificial Intelligence in Business and Industry* (pp. 291-303). IGI Global. https://doi.org/10.4018/978-1-7998-6985-6.ch013

Matsumoto, K., Yamada, H., Imai, M., Kawamura, A., Kawauchi, Y., Nakamura, T., & Kurazume, R. (2021). Development of a tour guide and co-experience robot system using the quasi-zenith satellite system and the 5th-generation mobile communication system at a Theme Park. *ROBOMECH Journal*, *8*, 1-14. https://doi.org/10.1186/s40648-021-00192-7

Mende, M., Scott, M. L., Van Doorn, J., Grewal, D., & Shanks, I. (2019). Service robots rising: How humanoid robots influence service experiences and elicit compensatory consumer responses. *Journal of Marketing Research*, *56*(4), 535-556. https://doi.org/10.1177/0022243718822827

Mingotto, E., Montaguti, F. and Tamma, M. (2021). Challenges in re-designing operations and jobs to embody AI and robotics in services. Findings from a case in the hospitality industry. *Electronic Markets*, *31*(3), 493-510. https://doi.org/10.1007/s12525-020-00439-y

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*, *15*(2017), 104-111. https://doi.org/10.54055/ejtr.v15i.265

Nguyen, Clinton (2016). Restaurants in China Replacing Waiters with Robots. *Business Insider,* available at: http://www.busines sinsider.com/chinese-restaurant-robot-waiters-2016-7/? internatio nal¼true&r¼US&IR¼T

Oğan, E. (2024). Artificial intelligence in restaurant businesses: a systematic review on service robots. *Worldwide Hospitality and Tourism Themes*, *16*(2), 150-162. https://doi.org/10.1108/WHATT-03-2024-0058

Parvez, M. O., Öztüren, A., Cobanoglu, C., Arasli, H., & Eluwole, K. K. (2022). Employees' perception of robots and robot-induced unemployment in hospitality industry under COVID-19 pandemic. *International Journal of Hospitality Management*, *107*, 103336. https://doi.org/10.1016/j.ijhm.2022.103336

Pierce, D. (2017). This Robot Barista Makes a Dang Good Latte. *Wired,* available at: https://www.wired.com/2017/01/cafe-x-robot-barista/.

Pillai, R., & Sivathanu, B. (2020). Adoption of AI-based chatbots for hospitality and tourism. *International Journal of Contemporary Hospitality Management*, *32*(10), 3199-3226. https://doi.org/10.1108/IJCHM-04-2020-0259

Rajaraman, V. (2014). JohnMcCarthy—Father of artificial intelligence. *Resonance*, *19*, 198-207. https://doi.org/10.1007/s12045-014-0027-9

Reis, J., Melão, N., Salvadorinho, J., Soares, B., & Rosete, A. (2020). Service robots in the hospitality industry: The case of Henn-na hotel, Japan. *Technology in Society*, *63*, 101423. https://doi.org/10.1016/j.techsoc.2020.101423

Rosete, A., Soares, B., Salvadorinho, J., Reis, J., & Amorim, M. (2020). Service robots in the hospitality industry: An exploratory literature review. In *Exploring Service Science: 10th International Conference, IESS 2020, Porto, Portugal, February 5–7, 2020, Proceedings 10* (pp. 174-186). Springer International Publishing. https://doi.org/10.1007/978-3-030-38724-2_13

Rother, E. T. (2007). Systematic literature review X narrative review. *Acta Paulista de Enfermagem, 20*(2), v-vi. https://doi.org/10.1590/S0103-21002007000200001

Ruel, H. and Njoku, E. (2021). AI redefining the hospitality industry. *Journal of Tourism Futures*, *7*(1), 53-66. https://doi.org/10.1108/JTF-03-2020-0032

Saputra, F. E., Buhalis, D., Augustyn, M. M., & Marangos, S. (2024). Anthropomorphism-based artificial intelligence (AI) robots typology in hospitality and tourism. *Journal of Hospitality and Tourism Technology*, *15*(5), 790-807. https://doi.org/10.1108/JHTT-03-2024-0171

Saydam, M. B., Arici, H. E., & Koseoglu, M. A. (2022). How does the tourism and hospitality industry use artificial intelligence? A review of empirical studies and future research agenda. *Journal of Hospitality Marketing & Management*, *31*(8), 908-936. https://doi.org/10.1080/19368623.2022.2118923

Shankar, V. (2018). How artificial intelligence (AI) is reshaping retailing. *Journal of retailing*, *94*(4), vi-xi. https://doi.org/10.1016/S0022-4359(18)30076-9

SoftBank Robotics. (2024). Service robot: Definition, advantages, and how to adopt. Available at: https://us.softbankrobotics.com/blog/service-robot

Sotohy, H. T. (2020). New trends in tour guiding, the guide faces technology 'applied study to selected sites in Egypt', *Journal of Association of Arab Universities for Tourism and Hospitality*, *19*(3), 35-47. https://doi.org/10.21608/jaauth.2021.53018.1099

Tussyadiah, I. (2020). A review of research into automation in tourism: Launching the Annals of Tourism Research Curated Collection on Artificial Intelligence and Robotics in Tourism. *Annals of Tourism Research*, *81*, 102883. https://doi.org/10.1016/j.annals.2020.102883

Yeh, C. C., Wong, C. C., Chang, W. W., & Lai, C. C. (2020). Labor displacement in artificial intelligence Era: A systematic literature review, *Taiwan J. East Asian Stud, 17*(2), 25–75.

Zhang, X., & Jin, H. (2023). How does smart technology, artificial intelligence, automation, robotics, and algorithms (STAARA) awareness affect hotel employees' career perceptions? A disruptive innovation theory perspective. *Journal of Hospitality Marketing & Management*, *32*(2), 264-283. https://doi.org/10.1080/19368623.2023.2166186

Złotowski, J., Proudfoot, D., Yogeeswaran, K., & Bartneck, C. (2015). Anthropomorphism: opportunities and challenges in human–robot interaction. *International journal of social robotics*, *7*, 347-360. https://doi.org/10.1007/s12369-014-0267-6