

Human–AI Collaboration in Tourism Work: A Systematic Review of Impacts on Jobs and Skills

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ABSTRACT

This study presents a systematic literature review (SLR) of artificial intelligence (AI) and its implications for employment, skills, and human–AI collaboration in the tourism and hospitality industry. AI technologies such as chatbots, service robots, biometric systems, and predictive analytics are increasingly adopted to improve efficiency and service delivery, but their impacts on workers remain contested. Using the PRISMA protocol, 97 peer-reviewed articles published between 2010 and 2024 were analyzed from Scopus, Web of Science, and ScienceDirect. The review reveals three central themes. First, AI is automating repetitive tasks in areas such as check-in, information provision, and reservations, leading to concerns about job displacement. Second, new opportunities are emerging as AI creates demand for advanced digital, analytical, and problem-solving skills, suggesting a gradual shift in workforce requirements. Third, human–AI collaboration is developing as a hybrid model, where workers complement AI technologies by providing emotional intelligence, cultural sensitivity, and personalized interactions that machines cannot replicate. Challenges include skill mismatches, worker resistance, ethical concerns, and uneven adoption across regions and enterprise scales. The findings emphasize that AI should be understood not as a substitute for human labor but as a transformative force reshaping workforce structures, necessitating strategies for reskilling and sustainable collaboration.

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INTRODUCTION

Artificial intelligence (AI) is rapidly transforming the tourism and hospitality industry, reshaping both service delivery and workforce structures. Technologies such as chatbots, service robots, predictive analytics, and facial recognition are increasingly deployed in hotels, airports, restaurants, and destinations to enhance efficiency, personalize experiences, and optimize operations (Ivanov & Webster, 2019; Tussyadiah, 2020). This digital transformation is often framed as an inevitable progression toward “smart tourism,” where AI plays a central role in managing data, streamlining customer interactions, and enabling predictive decision-making (Stankov et al., 2024).

While the potential of AI to improve productivity and service quality is widely acknowledged, its implications for employment and skills remain contested. Some scholars argue that AI threatens traditional jobs by automating routine and repetitive tasks in areas such as reservations, check-in, and basic customer service. Others suggest that AI can complement human workers by taking over standardized tasks, thereby freeing employees to focus on higher-value functions requiring emotional intelligence, creativity, and cultural sensitivity (Tussyadiah & Park, 2018). This perspective aligns with emerging notions of human–AI collaboration, where humans and machines work together in hybrid models rather than in zero-sum substitution scenarios.

The tourism workforce faces new pressures to adapt, particularly in acquiring digital literacy, data management, and problem-solving skills (Tuomi et al., 2021). However, adoption is uneven across enterprises and regions, with small and medium-sized operators often lacking the resources to invest in AI or workforce reskilling (Ivanov, 2024). Moreover, concerns about job security, worker resistance, and ethical questions surrounding surveillance and privacy continue to complicate implementation.

Despite growing interest, there has been limited synthesis of research on how AI is reshaping employment and skills in tourism. Most reviews focus on applications and technological adoption, but fewer investigate workforce consequences and the dynamics of human–AI collaboration. This study addresses that gap by

conducting a systematic literature review of peer-reviewed studies published between 2010 and 2024. The aim is to analyze how AI influences employment structures, skill requirements, and collaboration between humans and machines, and to provide an integrative framework for understanding workforce adaptation in an AI-enabled tourism future.

METHODOLOGY

This study adopted a systematic literature review (SLR) approach to provide a comprehensive synthesis of research on artificial intelligence, employment, skills, and human–AI collaboration in the tourism and hospitality sector. The review was guided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) framework, which ensures a rigorous, transparent, and replicable process of identification, selection, and analysis.

The search strategy was carried out in January 2024 across three leading academic databases: Scopus, Web of Science, and ScienceDirect. These databases were chosen because of their broad coverage of tourism, management, and technology journals. The search string combined terms for artificial intelligence technologies, the tourism and hospitality sector, and employment or workforce implications. In practical terms, the keywords included “artificial intelligence,” “AI,” “machine learning,” “robots,” “chatbots,” and “automation” in combination with “tourism,” “hospitality,” “hotel,” or “travel,” and further linked with “employment,” “workforce,” “skills,” “jobs,” or “human–AI collaboration.” The review covered studies published between 2010 and 2024, reflecting the period in which AI applications began to gain significant traction in the tourism sector. Only peer-reviewed articles written in English were considered eligible for inclusion.

The process began with an initial pool of 1,026 records. After removing duplicates, 874 studies remained for screening. Titles and abstracts were examined to assess relevance, resulting in 211 articles for full-text review. Following this detailed screening, 97 studies were included in the final analysis. The screening process was documented in a PRISMA flow diagram, illustrating the stages of identification, screening, eligibility, and inclusion.

Data from the final set of studies were systematically extracted using a coding framework. For each article, information was collected on authorship, year of publication, the type of AI technology examined, the tourism subsector under study, the reported implications for employment and skills, the nature of human–AI interaction (whether substitution or augmentation), and the geographic context. To ensure consistency, two researchers independently coded the data. Differences in interpretation were resolved through discussion, and inter-coder reliability was calculated with Cohen’s kappa reaching 0.82, indicating strong agreement.

The data analysis was conducted through thematic synthesis. Studies were grouped according to recurring themes that captured the main ways in which AI was influencing work in tourism. Particular attention was paid to the extent of automation and task displacement, the transformation of workforce skills and the need for reskilling, and the development of hybrid models where humans and AI collaborate in service provision. Trends over time and across different geographic contexts were also examined, allowing the review to highlight uneven adoption and regional differences in workforce impacts.

RESULTS

The review synthesized 97 peer-reviewed studies published between 2010 and 2024. The results are organized into three thematic clusters that capture how AI is influencing employment, workforce skills, and human–AI collaboration in tourism and hospitality. A combination of tables and figures is proposed to illustrate the distribution of studies, key technologies examined, and the main findings.

Automation and Task Displacement

One of the most prominent findings across the reviewed studies concerns the automation of routine and repetitive tasks in tourism and hospitality through artificial intelligence. A significant proportion of articles reported that service robots, chatbots, and automated booking systems are increasingly displacing human labor in front-desk operations, check-in processes, reservations, and basic information provision. Hotels in particular have adopted self-service kiosks and mobile applications to streamline guest arrivals and reduce waiting times (Ivanov & Webster, 2019; Lajante et al., 2023; van Doorn et al., 2017). Similarly, chatbots are widely used by airlines, travel agencies, and accommodation platforms to provide real-time responses to frequently asked questions, thereby reducing the need for human customer service representatives (Chau et al., 2025; Tussyadiah, 2020).

The displacement of human workers is most evident in tasks characterized by standardization and low complexity. For example, check-in and check-out procedures, confirmation of bookings, and the provision of general information about facilities or destinations are increasingly automated. Service robots, particularly in East Asian contexts, are also being used to deliver food, provide directions, or handle luggage, further reducing reliance on entry-level hospitality workers. While many of these technologies improve efficiency and reduce operational costs, they also raise concerns about job security and redundancy among tourism workers. Several studies reported heightened anxiety and resistance from employees who fear being replaced, particularly in regions where reskilling opportunities are limited (Tuomi et al., 2021).

The evidence suggests that automation does not eliminate all roles but rather shifts the structure of employment. Human workers remain necessary for complex, personalized, or emotionally sensitive tasks, yet the steady expansion of AI into basic service functions signals a reconfiguration of the tourism labor market.

Table 1. AI Technologies and Tourism Tasks Most Frequently Automated

AI Technology	Tourism Task Automated	Example Contexts
Chatbots / Virtual Assistants	Handling inquiries, booking confirmations, FAQs	Airlines, OTAs, Hotels
Service Robots	Front-desk assistance, luggage handling, food delivery	Hotels, Restaurants
Self-service kiosks	Check-in and check-out processes	Hotels, Airports
Mobile applications	Digital booking, room service requests, information access	Hotels, Tour Operators
Predictive booking systems	Automated reservations, dynamic scheduling	Travel agencies, Airlines

This table shows that the adoption of AI is concentrated in functions where efficiency and standardization can be maximized, reducing the need for routine human labor while simultaneously reshaping workforce requirements.

Workforce Skills and Reskilling Needs

The reviewed studies consistently demonstrate that the integration of artificial intelligence in tourism reshapes not only work processes but also the skill sets demanded of employees. As shown in Figure 1, digital literacy was the most frequently emphasized competency, appearing in more than two-thirds of the studies. Workers are increasingly expected to operate and supervise AI-driven systems such as chatbots, self-service kiosks, and predictive analytics platforms. This shift reflects the transformation of front-line service roles into technologically mediated tasks where familiarity with software interfaces and the ability to troubleshoot minor issues are now essential.

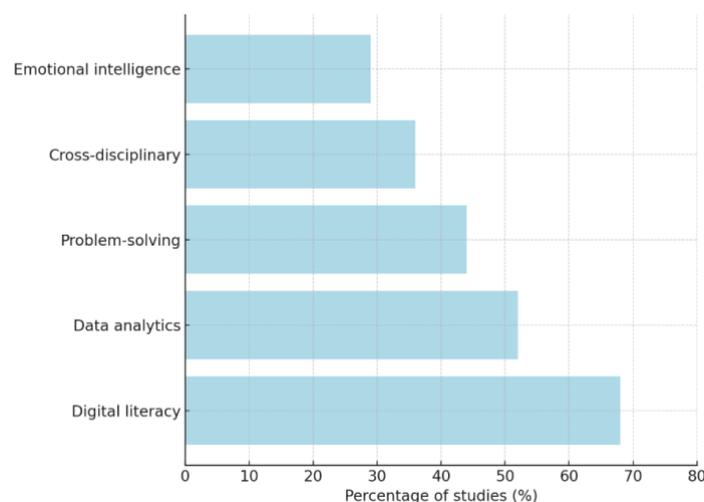


Figure 1. Workforce Skills

Data analytics was the second most commonly cited requirement, with just over half of the studies highlighting its importance. Employees are expected to interpret consumer data generated by AI systems in order

to support decision-making in pricing, marketing, and demand forecasting. The ability to translate data into actionable insights is becoming a critical factor in maintaining competitiveness.

Problem-solving and adaptive thinking were also emphasized, appearing in 44 percent of the literature. As AI systems manage routine functions, human employees are increasingly responsible for exceptions, complex inquiries, and emotionally nuanced interactions. In parallel, cross-disciplinary capabilities were mentioned in 36 percent of the studies, reflecting the need to combine technological proficiency with customer service expertise and cultural knowledge. Although less frequently highlighted, emotional intelligence remains central for ensuring that AI complements rather than replaces the human touch in hospitality contexts.

Despite this rising demand for advanced skills, significant gaps in workforce preparedness persist. Larger enterprises often provide structured training and reskilling programs, while small and medium-sized enterprises frequently lack the resources to invest in human capacity building. This uneven readiness underscores a major challenge in the equitable adoption of AI in tourism, where the risk of exclusion is concentrated among smaller operators and more vulnerable workers.

Human–AI Collaboration as a Hybrid Model

While automation and displacement dominate discussions of artificial intelligence in tourism, a substantial body of research highlights the emergence of hybrid models in which humans and AI work together rather than in competition. These studies suggest that instead of outright substitution, many enterprises adopt strategies where AI is deployed to handle routine, repetitive, or data-intensive tasks, while humans retain responsibility for functions requiring emotional intelligence, cultural sensitivity, and creativity. This collaborative approach is particularly visible in hotels, restaurants, and airlines, where service quality depends on a combination of efficiency and personalized engagement.

Table 2. Comparative Summary Of Substitution Versus Augmentation Models In Tourism AI Adoption

Dimension	Substitution Model	Augmentation (Hybrid) Model
Task type	Routine, repetitive, standardized tasks	Complex, emotional, creative, or unpredictable tasks
Typical technologies	Chatbots, kiosks, automated booking	Service robots, decision-support AI, predictive tools
Human role	Largely displaced or minimized	Focus on empathy, personalization, problem-solving
Benefits for organizations	Reduced labor costs, efficiency gains	Improved efficiency with retention of human touch
Challenges	Job loss, employee resistance, limited trust	Skill mismatches, training needs, organizational readiness

For example, service robots and chatbots often manage initial interactions by answering common inquiries or processing bookings, but human employees intervene when situations require empathy, nuanced cultural understanding, or conflict resolution (Tussyadiah & Park, 2018). In restaurants, robots may deliver food or take orders, while waitstaff provide interpersonal warmth and adapt to special requests. Airlines employ predictive analytics for scheduling and pricing, yet rely on human staff for passenger care during disruptions.

Although this hybrid approach is widely recognized as a pathway to maximizing the strengths of both AI and humans, challenges remain. Several studies note that employee resistance arises when workers fear being relegated to marginal or low-value tasks. Skill mismatches are also apparent, as workers may lack the technical training to collaborate effectively with AI systems. Moreover, organizational readiness varies significantly, with large multinational companies often better positioned to integrate hybrid models than small or medium-sized operators.

The evidence indicates that human–AI collaboration represents not a transitional phase but an enduring reconfiguration of labor in tourism. To succeed, it requires investment in both technological infrastructure and workforce development, ensuring that employees are not sidelined but empowered to complement machines in enhancing the visitor experience.

Cross-cutting Insights

Beyond the specific themes of automation, reskilling, and hybrid human–AI collaboration, several cross-cutting patterns are evident in the literature. One of the most notable is the uneven geography of AI adoption. Studies from advanced economies in Asia, Europe, and North America report higher levels of investment in AI

technologies and greater organizational readiness, often supported by robust training and reskilling initiatives. In contrast, research focusing on developing destinations, including Southeast Asia, Africa, and parts of Latin America, highlights slower uptake, resource constraints, and limited access to workforce development programs. This disparity suggests that the benefits and risks of AI are distributed unevenly across the global tourism system, raising concerns about widening inequalities between destinations.

A second pattern relates to ethical and governance challenges. Although many studies recognize the potential of AI to improve efficiency and customer experiences, they also raise issues concerning privacy, surveillance, algorithmic bias, and fairness. For example, the use of facial recognition technologies in airports and hotels has been criticized for inadequate safeguards and potential misuse of sensitive data. Yet, despite frequent acknowledgment of these risks, the literature reveals that systematic frameworks for addressing ethical concerns are still underdeveloped, with most studies prioritizing operational rather than normative questions.

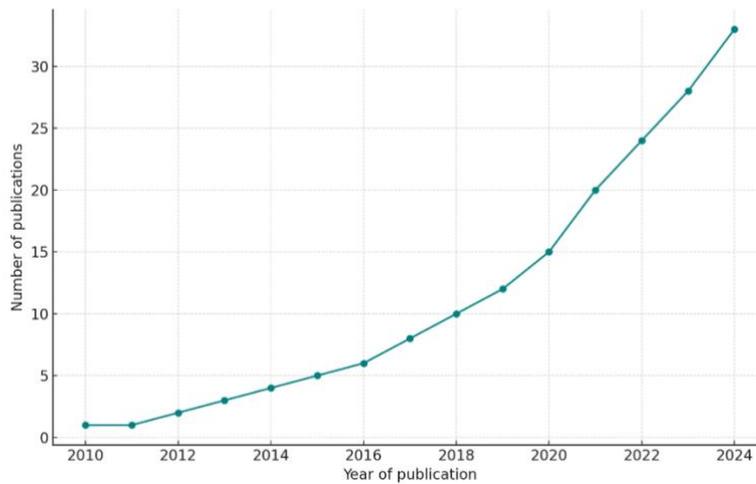


Figure 2. Number of Publications

Finally, a strong temporal trend can be observed in the research landscape. As shown in Figure 2, the number of publications on AI and workforce issues in tourism has risen steadily since 2010 but accelerated sharply after 2018. This surge coincides with the mainstreaming of service robots, chatbots, and predictive analytics in tourism operations, as well as growing public debate about the future of work in an AI-driven economy. The rapid expansion of scholarship reflects both the increasing relevance of AI to tourism practice and the urgency of addressing its consequences for labor.

Taken together, these cross-cutting insights highlight the importance of situating AI not only as a technological innovation but also as a social and ethical phenomenon. They underscore the need for greater attention to inclusivity, governance, and long-term workforce planning in order to ensure that AI adoption supports sustainable and equitable outcomes in tourism..

DISCUSSION

The results of this review highlight both the transformative potential of artificial intelligence in tourism and the significant challenges it poses for employment and workforce adaptation. The evidence shows that AI has already reshaped the organization of work by displacing routine tasks, requiring new skill sets, and creating hybrid models of collaboration between humans and machines. These findings align with broader debates on the future of work, where technology is not viewed solely as a substitute for human labor but as a catalyst for structural change (Ahmadi Zahrani et al., 2025; Frey & Osborne, 2017).

The automation of standardized service functions such as check-in, reservations, and routine information provision confirms predictions that AI is best suited to repetitive and data-driven processes. However, the persistence of human roles in areas demanding emotional intelligence, creativity, and cultural sensitivity underscores the complementarity between humans and AI. This mirrors conclusions in adjacent fields, where technology adoption is increasingly framed as augmentation rather than substitution (Tussyadiah, 2020). The hybrid model identified in this review suggests that future employment in tourism will depend on workers' ability to adapt to roles where human and machine capabilities intersect.

The findings also demonstrate that the integration of AI generates new demand for skills in digital literacy, data analytics, and adaptive problem-solving. Yet the uneven preparedness of the workforce, especially in small and medium-sized enterprises, reflects systemic disparities in training opportunities and organizational

readiness. Without inclusive investment in reskilling, the adoption of AI risks deepening labor market inequalities by concentrating opportunities in larger enterprises and advanced economies. This echo concerns raised in the literature on digital divides in tourism, where technology adoption can exacerbate rather than reduce inequities (Ivanov, 2024; Stankov et al., 2024).

Ethical and governance challenges further complicate the integration of AI into tourism. While issues such as privacy, surveillance, and algorithmic bias are widely acknowledged, systematic approaches to regulation and accountability remain underdeveloped. This gap suggests that the discourse on AI in tourism has been dominated by operational concerns, with insufficient attention to the normative dimensions of responsible technology use. The lack of comprehensive frameworks raises risks of public mistrust and potential harm to vulnerable workers and consumers.

Finally, the rapid growth of research since 2018, as illustrated in Figure 2, reflects both technological advances and heightened awareness of workforce implications. The concentration of scholarship in recent years indicates that AI in tourism is still in an early phase of conceptual and empirical development. Future studies should move beyond descriptive analyses of adoption to examine long-term workforce trajectories, regional disparities, and the integration of ethical considerations into organizational strategies.

In sum, this review demonstrates that AI is fundamentally altering the labor landscape in tourism. While it brings opportunities for efficiency and innovation, it also demands proactive strategies for workforce reskilling, inclusive adoption, and responsible governance. The challenge for both researchers and practitioners lies in ensuring that AI enhances rather than undermines the human dimensions that remain central to tourism experiences.

CONCLUSION

This systematic literature review synthesized ninety-seven peer-reviewed studies published between 2010 and 2024 to examine how artificial intelligence is reshaping employment, workforce skills, and human–AI collaboration in tourism and hospitality. The evidence shows that AI adoption is most prominent in the automation of routine and repetitive service functions such as check-in, reservations, and basic information provision. At the same time, the review highlights that human employees continue to play a critical role in tasks requiring empathy, creativity, and cultural sensitivity, resulting in hybrid models where AI augments rather than fully replaces human labor.

A second key finding concerns the transformation of workforce skills. Digital literacy, data analytics, and adaptive problem-solving have emerged as essential competencies, yet the literature points to persistent gaps in training and preparedness, particularly in small and medium-sized enterprises. This uneven readiness contributes to geographic disparities, with advanced economies moving faster in AI adoption while developing destinations lag behind. A third insight relates to the ethical challenges of AI use in tourism, including concerns over privacy, surveillance, and algorithmic fairness, which remain insufficiently addressed in current organizational and policy frameworks.

The study has several limitations. It is based on a review of published literature and may therefore omit insights from practice that are not captured in academic sources. Moreover, while the analysis covered global research, regional differences may be underrepresented due to the uneven distribution of studies. Future research should employ longitudinal and comparative approaches to examine workforce trajectories over time and investigate how cultural and institutional contexts shape the adoption of AI.

In terms of practical recommendations, the findings underline the importance of inclusive reskilling initiatives, particularly for vulnerable workers in small enterprises and developing destinations. Policymakers and industry leaders must integrate ethical considerations into AI governance and promote hybrid models that balance efficiency with human value. In doing so, tourism can leverage the opportunities of AI while safeguarding its essential human dimensions.

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Conflict of Interest

The author declares that there are no conflicts of interest that could have influenced the conduct or reporting of this study.

Data Availability

The data supporting this systematic review consist of secondary sources retrieved from academic databases including Scopus, Web of Science, and ScienceDirect. A full list of reviewed articles is available from the corresponding author upon reasonable request.

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