DIGITALIZATION IN THE TOURISM INDUSTRY: IMPACTS ON EMPLOYMENT, JOB SATISFACTION, AND CAREER DEVELOPMENT

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ABSTRACT

Digitalization has significantly transformed the global tourism industry, reshaping workplace structures, job roles, and employee responsibilities. This study examines the impact of digitalization on employees in the Serbian tourism sector, focusing on changes in workplace tasks, challenges and benefits of digital tools, job satisfaction and stress levels, and concerns regarding job security and career development. Using a qualitative research approach, semi-structured interviews were conducted with tourism employees across various sectors, including hotels, travel agencies, airlines, and hospitality services. Findings reveal that while digitalization enhances operational efficiency and reduces administrative burdens, it also introduces new challenges such as increased workload, digital fatigue, and job displacement risks. Automation and AI-driven tools have streamlined processes but reduced personal customer interactions, raising concerns about the loss of human-centered service. Employees expressed mixed feelings about digitalization, with mid-level and senior professionals viewing it as an opportunity for career growth, while entry-level workers feared job redundancy. The study underscores the need for structured digital training, adaptive workforce strategies, and balanced technological integration to support employees during the digital transition. These findings provide valuable insights for businesses and policymakers seeking to optimize digital transformation while ensuring workforce sustainability in the tourism industry.

Keywords: Digitalization, Tourism employment, Automation, Job security, AI, Workforce adaptation, Career development, Digital transformation.

INTRODUCTION

The rapid advancement of digital technologies has significantly transformed the global tourism industry, reshaping how businesses operate and how employees perform their daily tasks (Pencarelli, 2020; Nikolskaya et al., 2019). Digitalization has introduced automation, artificial intelligence (AI), and self-service technologies, optimizing service efficiency while simultaneously altering job roles and employee responsibilities (Chen et al., 2021). As the tourism industry increasingly adopts online booking platforms, AI-driven customer support, and digital payment systems, employees must navigate the evolving landscape of digital tools that are reshaping their work environment. While digitalization is often associated with efficiency gains, reduced workload, and improved accuracy, it also presents challenges such as increased job stress, the need for continuous adaptation, and concerns about job security due to automation (Kemer & Kirici Tekeli, 2022; Lee et al., 2025). Recent research has emphasized both the opportunities and risks that digitalization brings to tourism employment. Studies indicate that automation reduces repetitive administrative tasks,

allowing employees to focus on more complex problem-solving and guest relations (Ivanov et al., 2022). Moreover, AI-driven customer service tools, such as chatbots and virtual assistants, have significantly reduced response times and enhanced guest satisfaction (Ivanov & Webster, 2019). However, other studies highlight concerns about job displacement, skill redundancy, and the loss of human interaction in customer service roles (Huang & Rust, 2018; Dabić et al., 2020). Employees in entry-level or low-skilled positions are particularly vulnerable to job insecurity as self-service technologies and automated systems replace traditional roles (Ramos et al., 2024). Additionally, employees experience digital fatigue—defined as the mental exhaustion and cognitive overload resulting from prolonged exposure to digital technologies, frequent multitasking across platforms, and constant adaptation to evolving tools—and increased stress levels, as they must continuously adapt to evolving technologies while maintaining high service standards (Karatepe & Olugbade, 2017). The contrast between efficiency gains and workplace challenges underscores the need for further research into how digitalization is reshaping tourism employment, particularly in emerging markets such as Serbia.

The tourism industry in Serbia has also undergone substantial digital transformation in recent years. Many businesses, including hotels, travel agencies, airlines, and

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hospitality services, have integrated digital reservation systems, AI-powered chatbots, and contactless customer service solutions (Bradić-Martinović et al., 2023; Cimbaljević et al., 2023). While these advancements improve operational efficiency and customer experience, they also impact workplace structures, job satisfaction, and career progression. However, there is limited research on how employees in Serbia perceive these changes, particularly regarding their job security, workload, and long-term career prospects in a digitalized tourism environment.

This study aims to explore the impact of digitalization on employees in the Serbian tourism industry, focusing on four key areas: (1) Changes in workplace tasks due to digitalization, (2) Challenges and benefits of digital tools, (3) Impact on job satisfaction and stress levels, and (4) Long-term concerns about job security and career development. Using a qualitative research approach, the study examines employees' perceptions and experiences through semi-structured interviews, offering insights into the real-life implications of digital transformation in the workplace.

Understanding how digitalization affects tourism employees is crucial for businesses, policymakers, and industry leaders to ensure a balanced approach to technological integration and workforce well-being. By identifying both the advantages and challenges of digital tools in tourism work, this study provides valuable recommendations on how to enhance employee adaptation, develop effective digital training programs, and maintain a human-centered service approach despite increasing automation.

LITERATURE REVIEW

The impact of digitalization on workplace tasks

The impact of digitalization on workplace tasks in the tourism industry has been widely examined in recent research, highlighting both efficiency gains and structural job transformations. Digital tools such as online booking platforms, customer relationship management (CRM) systems, and AI-driven chatbots have significantly reduced the need for manual processing, allowing employees to focus on higher-value tasks (Gossling & Lane, 2015; David-Negre et al., 2018). For instance, automated check-in and mobile reservation systems have streamlined front desk operations in hotels, minimizing human intervention while improving customer convenience (Štilić et al., 2023). Similarly, in travel agencies, AI-based systems now handle itinerary planning, ticket reservations, and price comparisons, reducing the workload on human agents and shifting their role toward personalized travel consulting (Pillai & Sivathanu, 2020). While these advancements have improved speed, accuracy, and customer service delivery, studies indicate that

digitalization has also introduced new challenges and demands for employees. One significant concern is the increasing complexity of job roles, as employees are now expected to manage multiple digital platforms, interpret data analytics, and provide real-time digital customer support (Happ & Ivancso-Horvath, 2018). This shift has led to higher cognitive workload and the need for continuous upskilling, as workers must learn and adapt to new digital tools frequently (Qiu et al., 2022). Additionally, loss of personal interaction has been reported as a key drawback, particularly in customer service roles where automation has replaced face-to-face communication, potentially weakening guest relationships and service personalization (Zvaigzne et al., 2025).

Further research suggests that digitalization has not entirely replaced traditional workplace tasks but has reshaped them, requiring a balance between automation and human interaction. Studies on smart tourism destinations emphasize that technology should complement, rather than replace, human service, ensuring that employees still play a meaningful role in enhancing the customer experience (Jeong & Shin, 2020; da Costa Liberato et al., 2018). However, in industries with rapid technological shifts, such as aviation and hospitality, employees report higher stress levels due to constant digital system updates, increased multitasking, and performance monitoring through AI-driven analytics (Wang & Uysal, 2024). Despite these challenges, research highlights that effective digital training programs and skill development initiatives can mitigate negative impacts, helping employees adapt to new digital responsibilities while improving job satisfaction and productivity (Miso & Yang, 2023). Overall, the literature suggests that digitalization is transforming workplace tasks by reducing manual processes, increasing efficiency, and shifting employee roles toward technology-driven service delivery. However, the degree to which these changes positively or negatively impact employees depends on workplace support, digital training accessibility, and the extent to which automation replaces or enhances human interaction in the tourism industry.

Opportunities and challenges of digital tools in tourism work

The integration of digital tools in the tourism industry has revolutionized daily work operations, offering both significant opportunities and notable challenges for employees. On the positive side, digital tools such as AI-powered customer service, automated booking systems, and cloud-based management platforms have improved efficiency, accuracy, and service delivery (Pencarelli, 2020; Mobini et al., 2024). Employees benefit from reduced administrative burdens, as automation allows them to focus on higher-value tasks such as personalized guest interactions, problem-solving, and digital marketing strategies (Buhalis et al., 2019). Additionally, data-driven decision-making has empowered businesses and

employees to predict customer preferences, streamline operations, and enhance overall service quality (Wang, 2024). Digitalization has also introduced more flexible work environments, with remote access to digital platforms enabling employees—particularly in travel agencies and customer service roles—to work from different locations, improving work-life balance (Aranega et al., 2025). Despite these benefits, challenges associated with digital tools remain prevalent. One of the most significant concerns is the increased cognitive workload due to the need to manage multiple digital platforms, interpret complex data, and continuously adapt to evolving technologies (Kuklina et al., 2020). Employees often struggle with frequent system updates, software malfunctions, and the learning curve associated with new technologies, which can result in higher stress levels and decreased job satisfaction (Tussyadiah, 2020). Another major issue is the loss of human interaction, such as self-service kiosks, chatbots, and automated check-in systems that replace traditional customer-facing roles, reducing direct engagement between employees and guests (El Hajal & Yeoman, 2024). This shift has been particularly problematic in hospitality and tourism services, where personalized interactions are a core part of the guest experience. Additionally, job security concerns persist, as automation continues to replace lower-skilled roles, making workforce adaptability and continuous upskilling crucial for career sustainability (Dogan et al., 2024). Overall, while digital tools have significantly enhanced efficiency and service optimization, they have also introduced new pressures related to technological adaptation, increased workload, and reduced human interaction. The long-term impact of digitalization in tourism workplaces will largely depend on businesses' ability to provide digital training, support employee adaptability, and maintain a balance between automation and human-centered service delivery.

Digitalization, job satisfaction and workplace stress in tourism

The impact of digitalization on job satisfaction and stress levels in the tourism industry is highly complex and multifaceted, with research highlighting both positive and negative effects. On one hand, digitalization has streamlined routine tasks, reduced administrative workload, and improved workflow efficiency, leading to higher job satisfaction for employees who successfully adapt to new technologies (Suder et al., 2024; Filipiak et al., 2020). Studies indicate that AI-driven tools, digital booking platforms, and automation in customer service allow employees to focus on higher-value tasks, such as customer relationship management and problem-solving, rather than repetitive administrative duties (Saseanu et al., 2020). Furthermore, digital tools have provided more flexible work arrangements, particularly in travel agencies and hospitality management, where remote access to digital systems enables employees to work outside traditional office

settings, improving work-life balance (Ercik & Kardas, 2024). Employees who receive adequate digital training and are proficient in using AI-powered CRM systems, automated check-ins, and chatbot-assisted customer service often experience greater confidence in their work, which contributes to higher job satisfaction (Mariani et al., 2013). However, digitalization has also introduced significant stressors, particularly for employees who struggle with frequent system updates, multitasking across multiple platforms, and the need for continuous learning (Escandon-Barbosa et al., 2024). One major source of workplace stress is digital overload, as employees are now required to manage a combination of in-person customer interactions, online queries, digital payment systems, and real-time social media engagement (Bourliataux-Lajoinie et al., 2019). The expectation for constant availability and immediate digital responses can contribute to increased mental fatigue and job burnout, particularly in frontline tourism roles such as hotel reception, travel consultancy, and airline customer service (Abubakar et al., 2022). Another major concern is the loss of job security due to automation, as employees in entry-level administrative positions face the risk of displacement by AI-powered systems and self-service kiosks (Ercik & Kardas, 2024). Research suggests that when employees perceive digitalization as a threat to their job stability, they experience higher workplace anxiety, lower motivation, and reduced overall job satisfaction (Mohammad et al., 2019). Overall, the impact of digitalization on job satisfaction and stress levels in tourism depends largely on employees' ability to adapt, the level of organizational support, and the effectiveness of digital training programs. While digital transformation has the potential to enhance job satisfaction by reducing repetitive tasks and offering flexibility, it also creates new stressors related to digital adaptation, performance expectations, and job security concerns. Ensuring a balanced approach to digital integration, with adequate training and workforce support, is essential for minimizing digital-related stress and maximizing the benefits of workplace technology.

Digitalization, job security and career development in tourism

The long-term impact of digitalization on job security and career development in the tourism industry is a topic of growing concern, as advancements in automation, artificial intelligence (AI), and self-service technologies continue to reshape employment structures. Research suggests that low-skilled, repetitive tasks are the most vulnerable to automation, putting entry-level administrative positions, front desk roles, and travel consultancy jobs at risk (Arisoy, 2024; Carlisle et al., 2023). AI-powered chatbots, automated booking systems, and self-service kiosks have already replaced many traditional human-operated services, leading to fears of job displacement and redundancy in customer-facing roles (Pencarelli, 2019;

Moreno-Izquierdo et al., 2022). Employees who lack digital skills and technological adaptability are particularly at risk, as businesses increasingly prioritize tech-savvy professionals who can manage digital tools and data-driven decision-making processes (Seyitoglu et al., 2023). Despite concerns about job security, some studies highlight career development opportunities that digitalization brings to the tourism workforce. Research indicates that digital transformation creates new job roles in areas such as digital marketing, AI-driven customer service management, data analytics, and revenue optimization (Han, 2024). Employees who acquire advanced digital skills and adaptability are more likely to benefit from upward mobility and professional growth in the industry (Rodrigues et al., 2023). Furthermore, digital tools enable flexible work arrangements, allowing employees—especially in remote customer service, virtual tour guiding, and online travel consulting—to explore alternative career paths that were previously unavailable (Pencarelli, 2020). However, research also highlights the need for continuous training and reskilling programs to ensure that employees remain competitive in an increasingly digital job market (Ercik & Kardas, 2024). Studies suggest that companies that invest in digital workforce training not only enhance employee retention but also increase productivity and job satisfaction (Han, 2024; Filipiak et al., 2023). However, in some markets, including developing economies, access to structured digital upskilling programs is still limited, exacerbating concerns about inequality in career advancement (Okafor et al., 2023). Overall, while digitalization poses legitimate concerns about job displacement, it also presents opportunities for professional growth and new career pathways for those who embrace technological adaptation. The long-term sustainability of employment in tourism will depend on businesses, policymakers, and educational institutions investing in digital skills development, ensuring that employees can transition smoothly into the evolving landscape of the industry.

METHODOLOGY

Sample

The target population for this research consists of employees working in different sectors of the Serbian tourism industry, including hotels and hospitality (front desk staff, managers, reservation agents), travel agencies (travel consultants, tour operators, customer service representatives), airline and airport services (check-in agents, customer service staff), and restaurants and hospitality businesses (employees managing online reservations and digital payment systems). A purposive sampling method was used to ensure that participants have direct experience with digitalization in their work environment. The sample was diverse, incorporating employees from both large tourism enterprises and small to medium-sized businesses to reflect various perspectives on digital transformation. The study included a total of 20 employees from various sectors of the Serbian tourism industry. The age distribution of participants ranged from 22 to 56 years old, with the majority (12 participants) falling within the 26-40 age range, indicating that most interviewees had substantial work experience and had actively witnessed the digital transformation of the industry. The sample was evenly split by gender, with 10 male and 10 female participants, allowing for a balanced exploration of potential gender-based differences in perceptions of digitalization. Regarding work experience, participants had between 1 and 25 years of experience in the tourism industry, with an average tenure of 8.5 years. Among them, six were entry-level employees (e.g., hotel receptionists, customer service representatives, travel agents), nine were mid-level professionals (e.g., department managers, shift supervisors, tour operators), and five were senior employees (e.g., hotel directors, business owners, digital marketing coordinators). This range of roles provided insights into how digitalization affects employees at different career stages.

Participants were employed in various types of businesses, including five employees from international hotel chains, four from boutique hotels, three from travel agencies, three from airlines, three from tourism-related restaurants, and two from eco-tourism businesses. Their workplaces were located across Serbia, with 12 participants from urban areas (Belgrade, Novi Sad, Niš), five from major tourist hotspots (Zlatibor, Kopaonik, Vrnjačka Banja), and three from rural areas focusing on eco-tourism. This geographic diversity allowed the study to explore whether digitalization has had different impacts in technologically advanced urban settings compared to traditional tourism environments. The study also considered participants' levels of digital literacy and familiarity with digital tools. While all participants used digital systems in their daily work, only six employees reported feeling highly confident with digital technologies, whereas eight described themselves as moderately comfortable, and six felt that digitalization posed challenges requiring continuous adaptation. These insights helped highlight the varying levels of digital readiness within the industry and the need for tailored training and support for tourism employees.

Data saturation was achieved during the data collection process. After conducting and analyzing approximately 17 interviews, no new major themes emerged, and subsequent interviews confirmed existing findings, indicating that thematic saturation had been reached. The sample size of 20 participants was considered sufficient for this qualitative study, given the diversity of sectors, geographic locations, and professional roles represented. This breadth ensured that a wide range of experiences and perceptions regarding digitalization impacts in the Serbian tourism industry were

comprehensively captured. The sample size of 20 participants was deemed sufficient for a qualitative study, consistent with methodological guidance suggesting that sample sizes of approximately 10–20 can be adequate when thematic saturation is achieved and the population shares common experiences (Sandelowski, 1995). Although participants were drawn from different tourism sectors, their shared experience of adapting to digitalization within the Serbian tourism industry created a level of homogeneity that supports the adequacy of the sample size. This approach aligns with broader interpretations in the literature that smaller, focused samples can yield meaningful insights (Petrović et al., 2021; Vuksanović et al., 2024).

Interview process

Data collection was conducted in September and October 2024, through semi-structured interviews, which allowed participants to freely express their thoughts while ensuring that key research themes were covered. Each interview lasted approximately 30 to 45 minutes and was conducted either in person or via online platforms such as Zoom or Microsoft Teams, depending on participant availability. The interviews were audio-recorded with prior consent from participants to ensure accurate data collection. Additionally, participants were assured of their anonymity, with all responses kept strictly confidential. The interview guide included open-ended questions focusing on several key themes:

1. Changes in workplace tasks due to digitalization (e.g., automation of routine processes, use of AI-driven tools);
2. Challenges and benefits experienced with digital tools in day-to-day work.
3. Impact of digitalization on job satisfaction and stress levels.
4. Long-term concerns regarding job security and career development in a digitalized work environment.

These questions provided a framework for discussion while allowing participants to elaborate on their personal experiences and perceptions. Follow-up questions were asked during the interviews to explore specific issues in greater depth.

To the best of our knowledge, no previous qualitative study in Serbia has used semi-structured interviews with tourism employees across multiple sectors to explore the impacts of digitalization on workplace tasks, job satisfaction, stress levels, and career development. Existing studies have largely focused on organizational perspectives or technology adoption at the company level. Thus, this study provides an original contribution by directly examining employees' personal experiences and perceptions of digital transformation in the Serbian tourism industry.

Data analysis

The interview data collected was analyzed using thematic analysis, a widely used qualitative method for identifying patterns and themes within textual data. First, all interviews were transcribed verbatim, after which the researcher conducted an initial reading of the transcripts to become familiar with the data. Following this, coding was performed to identify recurring themes, such as shifts in job responsibilities, employee adaptability, and workplace stress related to digitalization. These themes were further categorized and analyzed in relation to existing literature and industry trends. NVivo software was used to assist in organizing and interpreting the data efficiently.

RESULTS

Changes in workplace tasks and digitalization

The findings reveal that digitalization has significantly transformed workplace tasks across different sectors of the Serbian tourism industry. While many employees acknowledged the efficiency and convenience brought by digital tools, some also expressed concerns regarding the increased workload, loss of personal interaction, and the need for continuous adaptation to new technologies. One of the most commonly reported changes was the automation of administrative tasks. Hotel receptionists, travel agents, and airline customer service representatives noted that online booking platforms, digital check-ins, and automated reservation systems have replaced many manual processes. A hotel front desk employee (P8) explained: "Before, we used to handle every check-in manually, filling out forms and verifying documents one by one. Now, most guests check in online, and we only step in when there's an issue."

This shift has allowed employees to focus more on guest experience but has also reduced the depth of guest interactions, which some employees felt weakened customer relationships. In travel agencies, digitalization has changed the role of travel consultants. With travelers increasingly booking their trips online, consultants now focus more on curating personalized experiences, managing online customer inquiries, and using AI-driven tools to recommend travel packages. As a travel agent (P12) described: "Ten years ago, customers walked in, and we planned their trips from scratch. Now, they come to us after browsing online, expecting us to refine their ideas rather than create them."

In the hospitality and restaurant sectors, employees reported a shift toward self-service technologies. Digital menus, mobile ordering, and contactless payments have streamlined operations, reducing the reliance on waitstaff for basic orders. A restaurant employee (P15) observed: "Guests now use QR codes to place their orders. While it speeds up

service, it also makes the job feel less personal, as we spend less time interacting with customers."

Additionally, the rise of customer relationship management (CRM) software, AI chatbots, and digital marketing tools has created new responsibilities for employees, particularly in hotel and tourism marketing roles. Several mid-level managers emphasized that staff must now be proficient in handling digital customer feedback, social media engagement, and real-time online reputation management. As a marketing manager in a boutique hotel (P6) put it: "We no longer just deal with guests during their stay. We engage with them before arrival through social media and continue conversations through automated follow-ups after they leave."

Despite the benefits of efficiency, some employees felt that digitalization had increased their workload rather than reducing it. Many expressed frustration over the need to constantly learn new software, update systems, and troubleshoot digital issues. A travel consultant (P10) mentioned: "Instead of simplifying my job, technology has made it more complex. I spend a lot of time learning new booking systems and explaining them to customers who struggle with them."

Overall, the results suggest that digitalization has led to a fundamental restructuring of workplace tasks, shifting employees' focus from manual, routine work to more customer engagement, problem-solving, and digital service management. While many appreciate the increased efficiency, there is also a sentiment of losing personal connection with customers and facing continuous adaptation pressures due to the fast-paced technological evolution.

The thematic Word Cloud (Figure 1) visually represents the most frequently mentioned terms, emphasizing key themes such as automation, efficiency, customer interaction, and digital adaptation. Employees frequently referenced AI chatbots, CRM software, and online booking systems, reflecting the increasing reliance on digital tools for customer service and reservation management.

Figure 1. Thematic Word Cloud: Changes in Workplace Tasks Due to Digitalization.

Additionally, terms like self-service, mobile check-in, QR ordering, and digital payment suggest a shift toward automated and contactless interactions, minimizing direct human engagement in routine operations. However, challenges associated with digitalization are also evident in the word cloud. Words like training, adaptation, system updates, and tech fatigue suggest that employees must continuously learn new technologies, which can sometimes lead to stress or frustration. Furthermore, terms such as customer interaction, guest experience, and human interaction reduction highlight concerns that while automation increases efficiency, it may also diminish the quality of personalized service. Overall, the word cloud illustrates a dual effect of digitalization—while it enhances operational efficiency and automates routine tasks, it also requires continuous adaptation and may reduce personal engagement in customer service.

A comparison of participant responses by geographic location revealed notable differences in experiences with digitalization. Employees in urban areas (Belgrade, Novi Sad, Niš) reported higher exposure to digital tools, greater familiarity with CRM systems and AI technologies, but also higher levels of digital fatigue due to the fast-paced work environment and continuous system updates. Participants from major tourist hotspots (Zlatibor, Kopaonik, Vrnjačka Banja) emphasized that digitalization significantly improved operational efficiency during peak seasons but also led to challenges with managing large volumes of online customer interactions in a short timeframe. In contrast, employees from rural areas focused on eco-tourism expressed concerns about insufficient digital infrastructure, slower adaptation to digital systems, and the risk that increased automation might undermine the highly personalized and authentic guest experiences central to eco-tourism operations. Despite these differences, employees across all regions recognized the necessity of adapting to digitalization for long-term career sustainability in tourism.

Day-to-day work and digital tools

The findings reveal a complex relationship between tourism employees and digital tools, with participants expressing a mix of enthusiasm for efficiency gains and concerns about increased workload and adaptation difficulties (Figure 2). While many employees acknowledged the benefits of digitalization in streamlining processes and improving service delivery, they also highlighted several challenges related to technical issues, training demands, and the impact on customer relationships. One of the most frequently mentioned advantages of digitalization was the improvement in efficiency and time management. Employees noted that automated booking systems, AI chatbots, and self-service technologies had significantly reduced the time spent on routine administrative tasks, allowing them to focus more on problem-solving and personalized customer service. A hotel front desk employee (P5) explained: "With mobile check-ins and online

reservations, we don't have long queues at reception anymore. We can now dedicate more time to assisting guests with
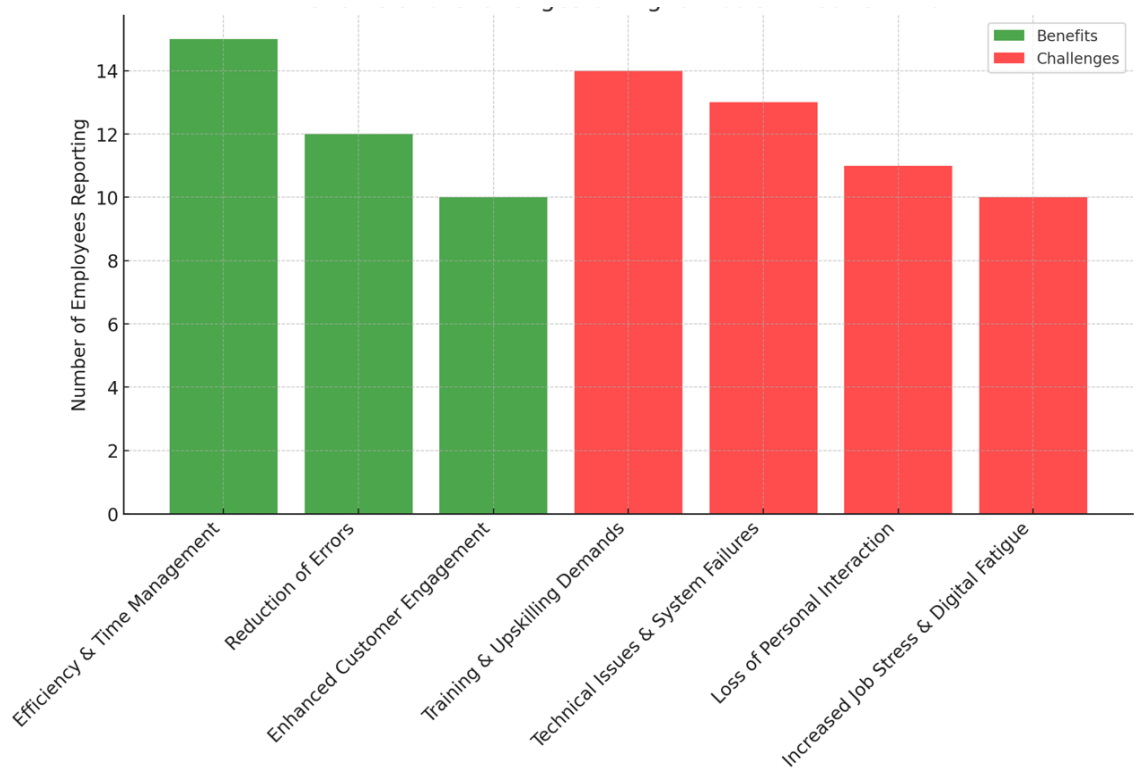
specific requests."

Figure 2. Benefits and Challenges of Digital Tools in Tourism Work.

Similarly, travel agents (P12, P14) reported that AI-powered tools helped them process customer inquiries faster, providing instant price comparisons and travel recommendations. Another key benefit mentioned by employees was the accuracy and reduction of human errors in daily tasks. Many participants, particularly those working in finance and reservations, emphasized that automated payment systems, CRM software, and digital inventory management minimized errors in transactions and bookings. A restaurant manager (P8) noted: "Digital ordering systems have reduced miscommunication between waitstaff and the kitchen, leading to fewer mistakes and a smoother workflow."

Additionally, several employees viewed digital tools as an enhancer of customer engagement and marketing strategies. Social media management tools, automated customer feedback systems, and targeted digital advertising were praised by marketing and guest relations staff for their ability to increase customer outreach and personalize services. As a hotel marketing manager (P9) stated: "We can now analyze guest preferences and tailor promotional offers accordingly, which helps in building stronger customer relationships."

Despite these benefits, employees also reported significant challenges in adapting to new digital tools. The most frequently mentioned concern was the constant need for training and upskilling to keep up with evolving technologies. Several employees expressed frustration over frequent system

updates and the learning curve associated with new software implementations. A travel consultant (P11) explained: "Just when we get comfortable with one platform, the company introduces another upgrade, and we have to learn everything from scratch again."

Another major challenge was technical difficulties and system reliability issues. Many employees mentioned glitches in booking platforms, AI-driven chatbots failing to resolve customer queries, and payment system failures, which sometimes led to delays, customer dissatisfaction, and extra workload for staff. A front desk receptionist (P7) highlighted: "When the self-check-in system crashes, we have to manually enter guest details, which takes even more time than the old method."

Additionally, loss of personal interaction with customers was frequently cited as a downside of digitalization. Employees in hospitality, tour guiding, and customer service roles expressed concerns that self-service kiosks, online bookings, and AI chatbots have reduced human engagement, making interactions feel more impersonal. A tour operator (P15) stated: "Part of what makes a travel experience special is human interaction. With automated services, we're losing that personal touch that builds customer trust."

Finally, some employees reported increased job stress and digital fatigue, as they were now required to monitor multiple digital platforms, handle online queries, and

troubleshoot system errors on top of their regular responsibilities. A hotel reservations agent (P13) described: "Before, I only had to deal with phone bookings and in-person check-ins. Now, I have to manage online chats, respond to emails, and assist guests using digital kiosks—all at the same time."

Impact of digitalization on job satisfaction and stress levels

The findings indicate that digitalization has had a mixed impact on job satisfaction and stress levels among employees in the Serbian tourism industry (Figure 3). While some employees appreciate the increased efficiency, flexibility, and new skill development opportunities, others report experiencing higher stress levels, digital fatigue, and pressure to constantly adapt to evolving technologies. Several participants noted that digital tools have simplified routine tasks, reduced errors, and allowed employees to focus on higher-value activities, contributing to increased job satisfaction. A hotel front desk employee (P3) stated: "Before digital check-ins, I spent most of my shift dealing with paperwork. Now, with automated systems, I can actually engage with guests and provide better service."
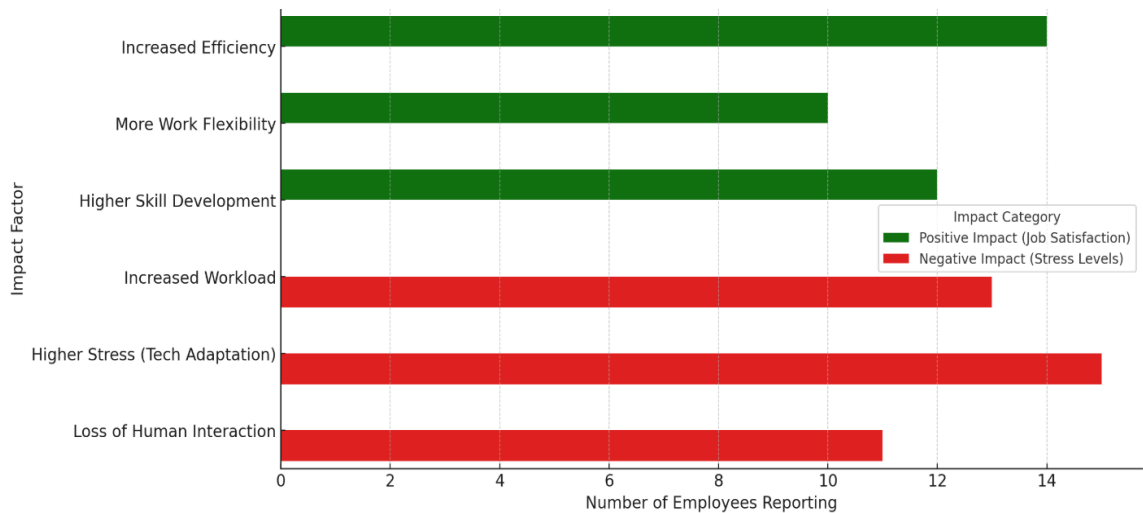

Figure 3. Job Satisfaction vs. Stress Levels Due to Digitalization.

Similarly, travel agents (P7, P9) expressed that AI-driven booking platforms have streamlined their workflow, enabling them to focus on curating unique travel experiences rather than managing repetitive administrative tasks. Another reported benefit was greater work flexibility due to digitalization. Employees in customer service and marketing roles mentioned that remote work options, digital communication tools, and cloud-based management systems have allowed for better work-life balance. A marketing specialist at a travel agency (P12) shared: "I can handle customer inquiries and social media campaigns remotely, which has given me more control over my schedule."

This flexibility was particularly valued by mid-level and senior employees who now have more autonomy in managing their tasks. Furthermore, some employees found professional growth opportunities in digitalization. Many reported feeling more motivated as they gained new digital skills and adapted to modern work environments, enhancing their career prospects. Employees in hotels, tour agencies, and airline services frequently mentioned that mastering digital tools had improved their confidence and sense of job security. Despite these benefits, a significant number of employees reported experiencing higher stress levels due to the constant adaptation to new technologies and the increased mental workload associated with digital tools. A travel consultant (P11) expressed frustration: "I feel like I'm in constant training mode. Every few months, there's a new system or an update, and we're expected to learn it instantly while still handling customers."

These disruptions were particularly problematic during peak tourism seasons when employees were already under pressure. Another significant challenge was the impact of automation on interpersonal interactions, which some employees found demotivating. Many frontline tourism workers expressed that digitalization had made their work feel impersonal and transactional. A restaurant employee (P14) shared: "With mobile ordering and digital payments, I barely talk to customers anymore. It feels like I'm just supervising a machine rather than providing hospitality."

This sense of detachment from traditional customer service roles contributed to lower job satisfaction for employees who valued human interaction. Lastly, multitasking and digital overload were frequently cited as sources of workplace stress. Employees now juggle multiple digital platforms, such as CRM systems, AI chatbots, online booking portals, and social media channels, which can be overwhelming. A hotel reservations agent (P8) explained: "I'm

managing emails, live chat, social media, and in-person guest requests all at the same time. It's exhausting."

This increased workload has led to higher rates of burnout, particularly among employees in high-demand tourism environments.

Job security, career development and digitalization

The findings reveal that employees in the Serbian tourism industry have mixed feelings about the long-term impact of digitalization on job security and career development (Figure 4). While some view digital transformation as an opportunity for professional growth, others express anxiety over job displacement, skill redundancy, and the increasing demand for continuous adaptation. A key concern among employees, particularly those in entry-level and administrative roles, is the potential replacement of jobs by automation and AI-driven technologies. Many participants fear that self-service kiosks, AI chatbots, and automated booking systems could reduce the need for human staff in roles such as hotel reception, customer service, and travel consultancy. A hotel front desk employee (P6) shared: "With digital check-ins and mobile room keys, I wonder if receptionists will even be needed in the future."

Similarly, a travel agent (P12) noted: "Customers can now plan entire trips using AI assistants. What will our role be in five or ten years?"
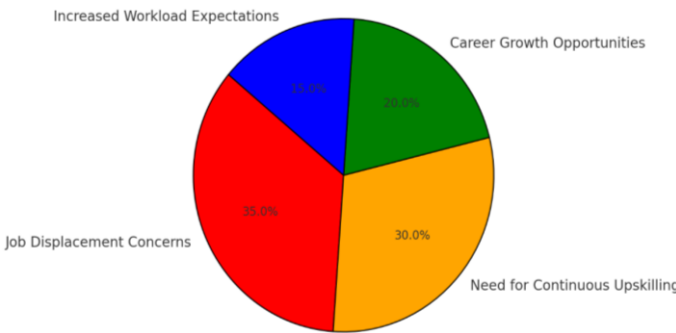

Figure 4. Employee Concerns and Opportunities Regarding Job Security and Career Development.

This uncertainty has created job insecurity, particularly for those who do not have specialized digital skills. On the other hand, some employees—especially those in mid-level and management positions—view digitalization as a career development opportunity. Several participants expressed that learning digital tools, data analytics, and AI-driven customer engagement strategies could enhance their employability and open new career paths. A hotel marketing manager (P8) explained: "Tourism is evolving, and those who adapt will have more opportunities. Digital skills are now as important as hospitality skills."

However, even employees with this optimistic outlook acknowledged that continuous upskilling is necessary, and those who fail to adapt may struggle to stay competitive in the job market. Another prominent concern was the growing pressure on employees to manage multiple digital platforms while still performing traditional customer service roles. Several participants stated that while digitalization enhances efficiency, it also increases workload and expectations. A restaurant supervisor (P15) noted: "Now I have to manage both in-person guests and online orders, plus handle digital marketing. It feels like three jobs in one."

This blending of digital and traditional responsibilities has blurred job roles, leading to concerns about burnout and unrealistic performance expectations in the long term. Overall, the results indicate a divided perception of digitalization's long-term impact. While some employees see it as a chance for career growth, others fear that automation and digital transformation could lead to job losses and an unsustainable work environment. The findings highlight the need for continuous training, career development programs, and policies that balance technological advancements with employee well-being in the tourism industry.

DISCUSSION

Interpretation and comparison of the results

The findings of this study highlight the complex and dual nature of digitalization's impact on employees in the Serbian tourism industry, with both positive transformations and new challenges emerging. These results align with global research on workplace digitalization in tourism, while also reflecting certain context-specific concerns related to digital adaptation and job security. In other words, the study confirms that digitalization has significantly transformed workplace tasks, particularly by automating administrative processes and shifting employee roles toward digital service management. Similar findings have been reported in studies on smart tourism, which emphasize the increasing reliance on AI chatbots, online reservation systems, and automated check-ins to enhance operational efficiency (Ivanov & Webster, 2019; Štilić et al., 2023). A study by Pencarelli (2020) also highlighted that tourism businesses worldwide are increasingly using self-service technologies to optimize workflow. However, a key distinction in this study is that Serbian employees expressed concerns about reduced personal interaction with customers, perceiving this as a drawback rather than an efficiency gain. In contrast, studies conducted in Western European countries (e.g., Spain and Germany) have found that employees see automation as an opportunity to focus on high-value tasks rather than routine procedures. The greater skepticism among Serbian employees could be attributed to differences in cultural expectations, where personalized guest experiences remain a core component of hospitality services.

The findings indicate a clear trade-off between efficiency gains and workplace challenges. Employees widely acknowledged that digital tools enhanced workflow speed, improved data accuracy, and facilitated customer engagement—findings that are consistent with studies by Buhalis et al. (2019) and Wang (2024) on technology-enhanced tourism operations. Practically speaking, research on digital transformation in hotels supports the claim that CRM software and AI-driven customer interactions optimize service delivery (Mobini et al., 2024; Pillai & Sivathanu, 2020). Nevertheless, employee frustrations over constant training, system glitches, and digital overload were prominent in this study. This aligns with research by Kuklina et al. (2020) and Tussyadiah (2020), which found that frontline employees often experience higher cognitive workload due to frequent technology updates. However, unlike studies conducted in highly digitalized markets such as the U.S. and Japan, where employees tend to adapt quickly due to stronger digital literacy training (Ivanov et al., 2022), this study suggests that Serbian tourism employees face greater challenges in upskilling, possibly due to limited formal digital training initiatives within the industry. The study provides contrasting perspectives on job satisfaction due to digitalization. While many employees appreciated increased efficiency and flexible work arrangements, others reported higher stress levels due to multitasking and digital fatigue. This aligns with Escandon-Barbosa et al. (2024), who found that while technology reduces physical workload, it simultaneously increases psychological strain, particularly in service-oriented industries. However, a notable difference in this study is the perception of digitalization as a source of job-related anxiety. In contrast to findings from Nordic countries, where employees reported greater job satisfaction due to smart tourism innovations (Jeong & Shin, 2020), Serbian employees expressed more concerns over work-life balance and technology-induced pressure. This may be influenced by structural and organizational factors—for example, smaller tourism businesses in Serbia may lack the resources to provide digital support and workload distribution mechanisms seen in larger, multinational tourism firms.

A major concern among Serbian tourism employees was the fear of job displacement due to automation. This is consistent with the "technology vs. employment" debate, where previous studies (e.g., Arisoy, 2024; Moreno-Izquierdo et al., 2022) suggest that low-skill service jobs are most vulnerable to AI-driven replacements. Employees in entry-level and administrative roles felt particularly at risk, mirroring the findings of Carlisle et al. (2023), who found that frontline hotel and airline employees are among the most exposed to automation-driven job cuts. However, unlike in some global studies that emphasize technological upskilling as a pathway for career growth (Han, 2024; Rodrigues et al., 2023), this study found that Serbian employees are less optimistic about long-term career benefits. While some mid-level and senior employees recognized digitalization as a growth opportunity, others—especially those with lower digital literacy—feared that their skills would become obsolete without proper retraining programs. This highlights a gap in structured workforce digital training in Serbia, which may need to be addressed through government and industry-led skill development initiatives to ensure career resilience.

The findings of this study suggest that while digitalization is inevitable in the tourism industry, its successful implementation depends on employee adaptation and organizational support. Compared to findings in more digitally advanced economies, Serbian tourism businesses need to prioritize structured digital training programs to enhance employee readiness and reduce resistance to technological changes. Additionally, hybrid models that balance automation with human-centered service delivery may help preserve the personal touch in hospitality, addressing employees' concerns about the loss of interpersonal interactions. Future research should explore how different organizational strategies can help mitigate digital-related stress, as well as examine how government policies on digital education and workforce training impact tourism employment trends in Serbia. Cross-national comparative studies could also provide valuable insights into how different economic and cultural contexts shape digital adaptation in tourism employment.

CONCLUSION

This study highlights how digitalization reshapes employee experiences in emerging tourism markets, balancing increased operational efficiency with heightened stress and job insecurity. The findings contribute theoretically by expanding the understanding of digital adaptation in less-studied contexts, while practically offering recommendations for businesses and policymakers to support workforce sustainability during digital transitions. The findings reveal that digital transformation has fundamentally reshaped job roles, enhancing efficiency and workflow automation, but also introducing new pressures related to continuous adaptation and workload management. Employees generally acknowledged that digital tools reduce administrative burdens, streamline customer interactions, and improve accuracy in bookings and payments. However, the study also identified significant concerns, including higher stress levels, digital fatigue, reduced human interaction, and fears of job displacement due to automation. The dual effect of digitalization—enhancing productivity while increasing cognitive and emotional strain—underscores the need for balanced technological integration in the tourism workforce.

Importance and implications of the results

Compared to findings in more digitally mature economies, Serbian tourism employees appear less optimistic about career growth opportunities associated with digital transformation. The lack of structured training programs and the fast-paced evolution of digital tools were key factors contributing to employees' apprehension about job security. Mid-level and senior employees who successfully adapted to new digital skills reported greater job satisfaction and professional growth, whereas entry-level employees, particularly in frontline service roles, expressed concerns about job redundancy due to automation. The study highlights several key implications for the tourism industry. First, businesses must invest in continuous digital training programs to ensure employees can keep up with evolving technologies. Second, hybrid models that combine automation with human-centered service delivery may help mitigate the negative impact of reduced customer interaction. Third, policymakers and industry leaders should develop workforce support initiatives to help employees navigate digital transitions without experiencing job insecurity or work overload.

Limitations and future research directions

While this study provides valuable insights into digitalization's impact on tourism employees in Serbia, future research could explore cross-country comparisons to understand how different economic and cultural factors influence employee adaptation to digitalization. Additionally, longitudinal studies tracking how employees' perceptions and job roles evolve over time would provide deeper insights into long-term workforce transformations in the tourism sector. Digitalization is an inevitable force shaping the tourism industry, offering both opportunities for growth and challenges related to workforce sustainability. Ensuring that employees are well-prepared for digital integration is crucial for maintaining a balanced and resilient tourism sector. By prioritizing employee well-being, structured digital training, and adaptive workforce strategies, tourism businesses in Serbia can navigate the digital transition while fostering a productive and satisfied workforce.

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