

THE FUTURE OF HOSPITALITY: RISKS AND CHALLENGES OF IMPLEMENTING AUTOMATED SERVICES

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Abstract: This study focuses on guest's attitudes and perceptions regarding automation in the hospitality sector, with particular attention to Serbia and Montenegro. The results of the survey indicate that the respondents are generally well-educated, with a strong representation of individuals holding graduate and master's degrees. The majority falls within the medium-income classes, influencing their perspective on the economic feasibility of automated services. The results show a nearly equal distribution of acceptance and skepticism about completely automated hotel services, highlighting notable diversity in comfort levels. The loss of warmth and personalized attention, possible decreases in service quality, employment displacement, and data privacy concerns are among the main concerns. However, the respondents accepted the benefits of automation, especially in transactional areas such as front desk operations and check-in/check-out services. Despite some openness to technological advancements, there remains a clear preference for human interaction in personalized services such as concierge assistance and housekeeping. The study concludes that a balanced approach, integrating automation in efficiency-operated areas, and preserving human elements in guest interactions, is necessary to ensure widespread acceptance of technology in hospitality.

Keywords: Automation in hospitality, Guest perception, Technological adoption, Service quality, Human interaction

Field: Social sciences

1. INTRODUCTION

Automation is a process in which machines are used to perform predetermined tasks (Ivanov et al., 2017). It aims to save time, reduce costs, and create consistent products. Initially used in production, automation is now present in daily life and across various types of services, such as automated lighting systems, autonomous vehicles, self-checkout machines, electronic toll collection, car climate control systems, and more. Younger generations generally support such innovations, valuing efficiency and novelty, while older generations may resist them due to fear of change, insufficient knowledge, and a desire for complete control, relying on established knowledge and experience. Regardless of the characteristics of each group, the question is how much effort they invest in gaining knowledge in science and technology, and how readily they can embrace changes in business practices like these.

Automation is also of tremendous importance in the tourism industry. Businesses aiming to satisfy tourists' needs and thus gain a competitive advantage in the market have started to integrate robotics and automation into their operations. A prime example is seen at airports, where passengers can check in and obtain boarding passes via kiosks based on their reservations, helping them avoid crowds and save time, which can significantly impact their overall satisfaction. Robots also greet guests upon hotel entry, prepare food in restaurants, serve guests, maintain cleanliness in hotel rooms and corridors, provide information about hotel services, and offer details about local tourist attractions (Ivanov, 2019).

2. LITERATURE REVIEW

Extensive research has been conducted on automation in the hospitality industry, uncovering various theories and models. Ivanov and Webster (2020) conducted an extensive examination of service robots in the hospitality industry, emphasizing their ability to improve efficiency and underscoring the importance of human engagement in maximizing guest satisfaction. Additionally, Witell et al. (2025) suggest a framework for managing service experiences that combines technology and human interaction to improve service quality.

Many researchers have investigated how automation impacts customer experience and the quality of service. According to a study by Berezina et al. (2019), automation can improve efficiency and decrease wait times, but if not carefully implemented, it may also result in lower perceived service quality. Likewise, Mandić et al. (2023) point out that guest satisfaction can be harmed by dehumanizing service delivery, underlining the significance of upholding personalized interactions in automated settings.

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Various risks and challenges related to automation in the hospitality industry are outlined in the literature. Karadayi-Usta (2024) highlights cybersecurity risks as a major worry, as growing dependence on technology may put sensitive customer information at risk. Paraskaves (2020) also points out economic risks, pointing to the high upfront expenses of introducing automated systems, which may not be balanced out by labor cost savings right away. Furthermore, Booyse & Scheepers (2024) examine the reluctance of workers towards automation, potentially impeding successful incorporation and influencing overall service excellence.

The success and adoption of automation in the hospitality industry differ depending on geographical and cultural settings. Yam et al. (2023) examine how cultural factors influence the acceptance of automation, noting that in societies that prioritize collective values, there tends to be a stronger preference for human interaction over automated processes. On the other hand, in societies that prioritize individualism, guests may show greater receptiveness toward technological advancements (Sunny et al., 2019). This variation highlights the importance for hospitality operators to take into account local cultural attitudes when introducing automated services.

Challenges in Implementing Automated Services

Automating services in the hospitality industry poses major technical, human, and cultural challenges. Technical obstacles involve consistently maintaining the system, implementing upgrades, and incorporating new technologies, which demand significant resources and expert technical assistance to guarantee smooth operation (Jebeen et al., 2022; Reis et al., 2020). Malfunctions in these systems may cause service quality to be disturbed, affecting customer satisfaction and possibly resulting in damage to reputation.

Employee reluctance towards technological changes, job loss fears, and worries about decreased personalization in guest interactions are significant obstacles, known as human factors, that come with the transition to automation (Brougham & Haar, 2020). Workers may view automation as a danger, resulting in pushback or reduced satisfaction with work, ultimately impacting productivity in a negative way. Moreover, a significant number of visitors continue to appreciate the personal element in hospitality services, viewing customization as an essential aspect of the overall guest experience. Automated services with minimal human interaction may be seen as impersonal or less attentive to personal guest requirements, possibly lowering overall guest satisfaction.

Cultural variances are also key factors in determining the adoption of automated services. Visitors from various nations and diverse cultural backgrounds differ in their receptiveness to technology, which can impact their readiness to interact with automated systems (Sunny et al., 2019). For instance, visitors from cultures that prioritize conventional service values might see automation as diminishing their hospitality encounters (Sunny et al., 2019). Hotel owners need to take into account cultural differences when implementing automation in order to avoid displeasure and pushback from guests, which may hinder the success and usage of such systems.

These challenges underscore the difficulty of incorporating automation in hospitality, as a delicate balance is needed between technological efficiency and maintaining the personalized service that is characteristic of the industry.

Risks Associated with Automation

The implementation of automation in the hospitality industry poses various risks that need to be carefully controlled for effective integration. Concerns about security are a major issue, especially in relation to cyber security and safeguarding guest information (Shabani & Munir, 2020). Automated systems, vulnerable to cyberattacks, frequently necessitate internet connectivity and handle sensitive guest information. This potential danger leads to fears about unauthorized access to data and infringements on privacy, both of which can lead to legal responsibility and harm a hotel's image.

There are also significant risks to service quality because automation may make the guest experience feel less personal. Due to limited chances to engage with employees, visitors might perceive the service as impersonal, missing the warmth and attentiveness usually linked with hospitality (Mandić et al., 2023). The reduced human touch may impact guest satisfaction negatively, as numerous clients anticipate customized service during their hotel stay. Economic uncertainties are particularly important because the introduction of automation requires significant upfront investments, and its long-term viability is still questionable. Investing in software, equipment, and employee training, in addition to maintenance expenses, can be expensive for smaller companies. The hotel's economic performance may suffer if the projected return on investment doesn't materialize. Social risks include potential job cuts and changes in the workforce composition, as the number of traditional employees may be reduced as a result of automation. This change requires a staff that is proficient with technology and has an impact on the area's employment and social composition. Employee morale may suffer as a result of such adjustments,

and social worries about job security and safety in the hospitality sector may rise. Together, these risks highlight how crucial it is to have a well-rounded strategy when deploying automation, taking into account the trade-offs between technological advancement and its effects on security, service quality, economic viability, and social implications.

3. RESULTS AND DISCUSSION

A comprehensive overview of the demographic and socioeconomic characteristics of respondents is given by the survey, which was carried out in October and November of 2024 (Table 1). This fundamental knowledge is essential for examining attitudes and views regarding the use of automated services in the hospitality sector. The research was conducted through an online questionnaire distributed via email and other communication channels.

The majority of respondents were female, accounting for nearly two-thirds of the sample, while males represented just over one-third. Given that the majority of participants were female, this gender gap draws attention to the possible variations in how automation in the hospitality industry may be seen.

Younger people were the survey's primary target demographic, with almost half of respondents being between the ages of 18 and 25. People between the ages of 26 and 35 made up a significant contribution, while people over 35 and younger formed up a much smaller number. This preference for younger populations is a reflection of their affinity for innovation and technologically inclined behavior.

A significant number of the participants had bachelor's and master's degrees, demonstrating their exceptional level of education. Over 25% of the sample had completed postgraduate studies, and over 50% had a bachelor's degree. A smaller proportion reported only having completed high school, while very few held doctorates. This high level of education suggests that the respondents are likely to have a solid understanding of technological advancements and their implications.

The majority of respondents earned between €500 and €1,000 per month, placing them in the middle-income range. Lower-income groups and wealthy individuals were underrepresented, whereas a smaller but notable percentage indicated higher incomes between €1,000 and €1,500. The majority of respondents in this distribution are middle-class, and their opinions are probably shaped by financial factors related to the price and worth of automated services.

More than 80% of the sample consisted of respondents who were based in Serbia, with Montenegro contributing a noteworthy percentage of about 15%. Because it captures the distinct cultural and economic circumstances of the Western Balkans, where automation in the hospitality industry may confront particular opportunities and problems, this regional representation is essential for placing the findings in context.

Table 1. Socio-Demographic Profile of Respondents

Characteristic	Frequency	%	Characteristic	Frequency	%	Characteristic	Frequency	%
<i>Respondent's sex</i>			<i>Education</i>			<i>Monthly income (in €)</i>		
Male	72	38.1	High school	45	23.8	<500	35	18.5
Female	117	61.9	Bachelor's degree	87	46	500-1000	95	50.3
<i>Age category</i>			Master's degree	50	26.5	1001-1500	42	22.2
Age category: below 18	11	5.8	PhD degree	6	3.2	1501-2000	11	5.8
Age category: 18-25	89	47.1	Other	1	0.5	>2000	6	3.2
Age category: 26-35	81	42.9	Total	189	100	Total	189	100
Age category: 35+	8	4.2						
Total	189	100						

Source: Authors' analysis

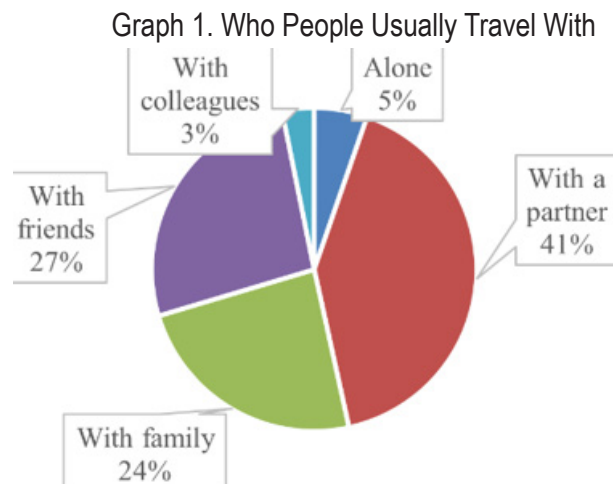
The data presented in Graph 1 shows that a significant portion of respondents, nearly 41%, typically travel with their partners, making this the dominant travel dynamic in the sample. This finding highlights the importance of shared experiences during travel and the role automation might play in enhancing or detracting from these moments. For example, couples might seek convenience and seamless integration of services, such as automated room customization or personalized dining experiences, that caters to both individuals simultaneously. At the same time, this reliance on shared experiences could mean that an overly mechanized environment lacking warmth might alienate such travelers, who often look for romantic or intimate atmospheres that machines struggle to create.

Traveling with friends, which accounts for 27% of respondents, also emphasizes the social aspect of travel. Groups of friends may be drawn to automation features that simplify group logistics, such as

automated payment splitting or activity coordination. However, this demographic might also be more inclined to experiment with novel technologies, as their travel experience often prioritizes fun, adventure, and new experiences.

Family travel, representing 24% of the responses, introduces a unique set of expectations for automated services. Families might appreciate features that enhance safety and efficiency, such as automated child-friendly room settings or parental controls on entertainment systems. However, this group might also have concerns about technology replacing the human warmth they expect when traveling with children, such as the reassurance of a helpful staff member in moments of need.

Smaller proportions of respondents indicated traveling alone (5%) or with colleagues (3%). These groups represent niche segments, but they offer key insights. Solo travelers, for instance, may appreciate the security and convenience automation can provide, such as contactless check-ins and virtual assistance. Business travelers, on the other hand, might prioritize efficiency and functionality, valuing automation for streamlined processes that save time.

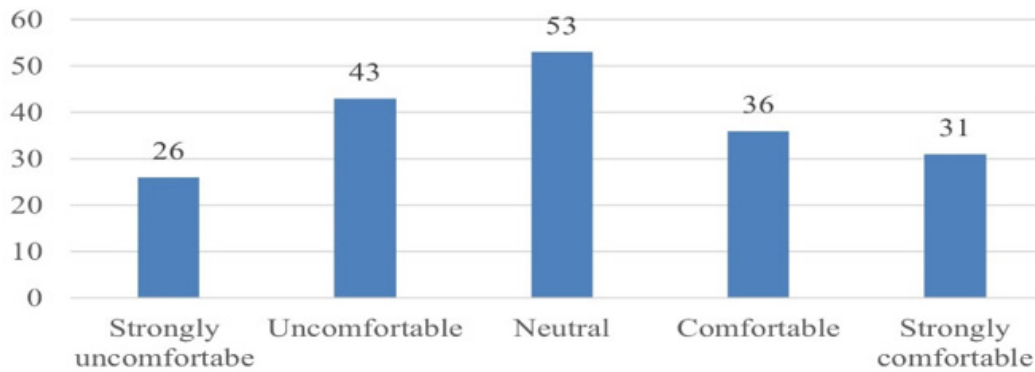


Source: Authors' analysis

The survey reveals a significant divide in comfort levels regarding fully automated hotel services (Graph 2). While a notable number of respondents (67 in total) reported feeling either “comfortable” or “very comfortable,” an almost equal proportion (69) expressed discomfort. This stark division underscores the polarized attitudes toward automation, rooted in both personal and generational differences.

Those who feel comfortable with automation are likely younger, tech-savvy individuals who have grown up alongside rapidly advancing technologies. This group may appreciate the efficiency, novelty, and modernity that automation brings to their hospitality experience. For these respondents, automation aligns with their expectations of convenience and the ability to accomplish tasks with minimal effort. However, even within this group, neutrality among 53 respondents suggests a degree of uncertainty or unfamiliarity with how automation might impact their overall experience. On the other side, discomfort with automation appears to stem from deeper anxieties about losing the human touch, a core element of hospitality. Many individuals may fear that automated processes will lack the empathy, adaptability, and personal attention that human staff can provide. Older respondents, in particular, are likely to struggle with the idea of fully automated environments, not only due to unfamiliarity with technology but also because of a greater emphasis on personal interaction and traditional service models

Graph 2. Guest Comfort Levels with Fully Automated Hotel Services



Source: Authors' analysis

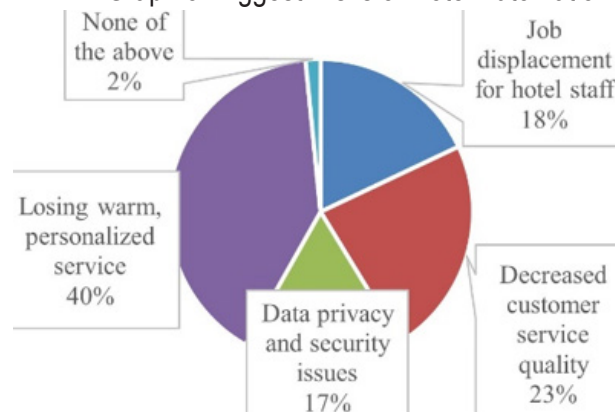
The answers to questions about respondents' concerns about automation in the hotel sector revealed some of the most significant challenges the sector must overcome to achieve broad acceptance (Graph 2).

40% of respondents said that the loss of warmth and individualized service was their top worry. The core of hospitality, which depends on interpersonal communication is closely related to this reaction. Although machines can be efficient, they frequently can't replicate the thoughtful, compassionate reactions that customers associate with exceptional service. A robotic concierge, for instance, might be able to deliver precise information, but it cannot offer the same level of comfort as a human who genuinely listens to issues and addresses them. The possible decline in service quality is another significant concern, as mentioned by 23% of respondents. This fear probably originates from the idea that machines might have inflexible programming and be unable to adjust to particular or challenging circumstances. When a guest has a problem with their room, for example, they might prefer to talk to a human who can provide prompt assurance and innovative solutions, as opposed to an automated system that might just provide a few answers.

Attitudes are also influenced by ethical and economic considerations. Concerns about hotel employees losing their jobs were expressed by 18% of respondents, which is indicative of a larger social concern about automation replacing human labor. In areas like Serbia and Montenegro, where job stability and economic conditions are significant issues, this subject is especially important.

Finally, 17% of respondents mentioned privacy and data security issues, which reflect the growing anxiety around the handling of personal data in automated systems. People may be concerned about possible data misuse, particularly in situations where automation depends on gathering and evaluating vast volumes of personal data to deliver customized services.

Graph 3. Biggest Risks of Hotel Automation



Source: Authors' analysis

The data indicate that the highest potential for automation lies in front desk services, such as check-in and check-out, with 40% of respondents viewing this as an area where automation could be beneficial (graph 4). This finding aligns with broader trends in the industry, where self-service kiosks and mobile applications are increasingly implemented to enhance efficiency and reduce wait times. Front desk

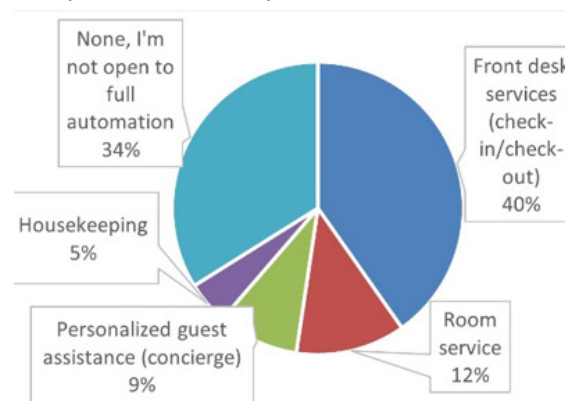
operations are perceived as transactional rather than personal, making them an ideal starting point for technological intervention.

In contrast, room service, which 12% of respondents identified as having automation potential, reflects a moderate acceptance of technology in tasks traditionally associated with human interaction. The increasing use of delivery robots and app-based ordering systems likely contributes to this view, particularly as these methods prioritize hygiene and speed. Personalized guest assistance, such as concierge services, received support from only 9% of respondents. This result underscores the enduring importance of human interaction in providing tailored advice and emotional connections, which many guests associate with quality service.

Housekeeping services were identified as the least suitable for automation, with only 5% of respondents expressing openness to technological integration in this domain. This hesitation likely stems from doubts regarding the effectiveness of robotic cleaning systems and a preference for the meticulous attention to detail that human staff can provide. These results suggest that tasks requiring a personal touch and high adaptability are less likely to benefit from automation without significant advancements in technology.

Interestingly, 34% of respondents expressed a clear preference for retaining traditional, human-operated services, indicating a substantial resistance to full automation. This finding aligns with concerns about the potential loss of warmth, empathy, and adaptability, which are integral to the hospitality experience. Such resistance is particularly pronounced among older demographics and individuals less familiar with technological advancements, as suggested in the survey's demographic analysis.

Graph 4. Aspects of Hotel Experience That Could Be Fully Automated



Source: Authors' analysis

The findings from this graph complement the broader themes identified in the study. Younger, tech-savvy participants are more inclined to embrace automation in areas where convenience and efficiency are prioritized, such as front desk and room service. Conversely, the significant resistance to automation in personalized and housekeeping services aligns with the cultural and social emphasis on human interaction observed in Serbia and Montenegro, where the majority of respondents reside. The economic context also plays a role, as concerns about job displacement in the hospitality sector are likely influencing the reluctance to fully embrace automation.

4. CONCLUSIONS

In conclusion, the data illustrate a nuanced perspective on automation in hospitality, where respondents favor a selective approach that combines technological efficiency with human adaptability. The hospitality industry must address these concerns by implementing automation in transactional areas while preserving human involvement in personalized services. Additionally, strategies such as staff upskilling and robust privacy measures can mitigate ethical and practical concerns, fostering greater acceptance of technological advancements. Furthermore, strategies like employee upskilling and strong privacy safeguards can allay moral and pragmatic worries and promote broader adoption of technology. The findings highlight both the advantages and drawbacks of automation. Respondents are concerned about the possible loss of human warmth and personal attention, even while automation offers obvious advantages in terms of efficiency and cost-effectiveness, especially in front desk services. The cultural and economic background of Serbia and Montenegro additionally impacts attitudes, with acceptability

levels being significantly influenced by factors like job security and technological familiarity.

Businesses must use a selective approach that emphasizes human contact in areas that demand empathy while using technology to improve transactional process efficiency if they want to successfully use automation in the hospitality industry. Furthermore, addressing concerns related to service quality, job displacement, and data privacy will be crucial in fostering positive perceptions of automation. The industry needs to take into account hybrid models that blend technical innovations with human flexibility to guarantee a smooth and pleasant experience for every guest.

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