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Exploring the relationship between robot employees' perceptions and robot-induced unemployment under COVID-19 in the Jordanian hospitality sector

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A B S T R A C T

The topic of robots is gaining traction in both academic discourse and popular media due to their growing prevalence in the hospitality sector. The hospitality industry is likely to encounter practical challenges in adopting the increased use of robots. The primary objective of the present research was to conduct an empirical investigation into a theoretical framework that explores how employees view robot-caused unemployment, with particular attention given to their perceptions of robot adoption. The study utilised structural equation modelling to analyse data obtained from 401 service employees in Jordan through online questionnaires. The findings indicate that the perception of robot-induced unemployment among employees is significantly influenced by their social skills, perceived risk, awareness, and trust in using service robots. The present study established a theoretical framework for investigating user perceptions of robot-induced unemployment within the particular setting of hospitality robots. The findings offer valuable insights for guiding future development and research efforts in the hotel service robot industry as well as informing marketing strategies for hotel managers. Ultimately, these efforts may contribute to the sustainable growth of service robots and associated sectors, including the hotel service sector.

1. Introduction

Recent technological advancements have provided modern industries with advantages in integrating diverse interactive technologies into their service settings, thereby substituting or enhancing a significant portion of human labour (Omar et al., 2022; Huang, 2022). The utilisation of robots in various business sectors is becoming more prevalent, and as a result, it holds significant potential for both disruptive and innovative impacts on business operations. The utilisation of robots has become increasingly prevalent in various industries, including medicine, elder care, agriculture, home cleaning, and others, as evidenced by the works of Brynjolfsson et al. (2014), Gretzel (2016), and Collins et al. (2017). The utilisation of robots in the hospitality and tourism sectors has garnered attention in academic literature, as noted by Driessen and Heutinck (2015) and Tussyadiah and Park (2018). Zhao (2022) and provide a comprehensive survey of contemporary robotic technologies employed by tourism and hospitality firms, while acknowledging the paucity of extensive research on the subject. The scholarly article by Ivanov et al. (2017) provides an in-depth examination of the existing literature on the utilisation of robots in the tourism and hospitality industries. Additionally, the authors outline a research agenda for future investigations in this area. The authors of a previous publication examine the phenomenon of anthropomorphism, or the attribution of human-like qualities to non-human entities, in service robots utilised in the tourism and hospitality sectors. They analyse the potential implications of this trend and also highlight the emergence of novel technologies in the hotel industry, specifically the integration of robots in the hospitality domain (Murphy et al., 2017). In their research, Kuo et al. (2017) aimed to create a SWOT analysis regarding the implementation of robots within hospitality enterprises in Taiwan. On the other hand, Tung and Law (2017)

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focused on identifying potential areas for research in the context of human-robot interactions within the hospitality and tourism industries. The authors, Schommer et al. (2017) and Ivanov et al. (2017), respectively, examine the development of hospitality facilities that are conducive to the accommodation of robots and the advantages and expenses associated with the integration of robots into the operations of travel, tourism, and hospitality enterprises. The ongoing expansion of service robots is anticipated to persist. Omar et al. (2022) reported that the global service robot market was valued at $295.5 million in 2020. Moreover, it is projected that the market for robots in the hospitality industry will experience significant growth, reaching a valuation of $291.74 million by 2026, with an average yearly increase of 11.6% during the period from 2022 to 2026. The present study reveals that robots are being employed in the tourism and hospitality sectors across multiple phases of the customer journey. These stages include pre-arrival, such as the implementation of chatbots and virtual reality, and arrival, which involves the use of robotic porter services, digital kiosks, and smart room keys, as reported by Technavio (2022). Throughout their stay, patrons have the opportunity to encounter automated check-in procedures facilitated by mobile applications, front desk robotic assistance, and delivery amenities. The proliferation of digital services in the aftermath of the pandemic has given rise to new circumstances, wherein the adoption of robotics has been significantly amplified. Scholars have predicted that this trend is likely to persist in the foreseeable future, as evidenced by the works of Ukpabi et al. (2019) and Parvez et al. (2021). Apart from the process of digitalization, hoteliers and consumers are placing greater emphasis on alternative service methods, including contactless services that entail minimal human interaction (Lin et al. 2021). Koumelis (2020) states that the COVID-19 outbreak has culminated in an important change in consumer demands, with a move away from individualised services and towards ones that call for little to no physical contact as a preventative measure against infection. The emergence of novel realities and technological advancements has created a novel realm of prospects for the integration and utilisation of service robots. According to Luo et al. (2021), advancements in technology, such as the use of service robots, possess an intrinsic capacity to mitigate apprehension and unfavourable attitudes towards the provision of hospitality services. Initial academic investigations into service robotics have determined that service robots present a feasible substitute for the tourism and hospitality industries (Huang 2022). The increasing integration of robotics in various industries, coupled with the research conducted by McKinsey Global Institute, which predicts that robotics will be responsible for powering between 400 and 800 million jobs in the industry by 2030, highlights the importance of comprehending service employees' attitudes towards the adoption of robotics. This understanding is crucial in motivating them to provide exceptional service while on the job (Bowen & Morosan, 2018; Koo et al., 2021). The significance of robots in the service industry has been highlighted by scholars and professionals as they contribute to enhanced productivity and customer satisfaction. These outcomes have a direct influence on the organisation's culture, employment, structure, processes, and decision-making, as noted by Bowen & Morosan, (2018). According to Xu et al. (2020), similar to any new technological revolution, organisations are required to strike a balance between the opportunities presented and the constraints imposed by existing organisational procedures and policies. Although robotics, machine learning, and artificial intelligence are emerging topics in the literature on tourism and hospitality, there has been limited research attention paid to employees' perceptions of service robots and their effect on the management of hospitality performance, adoption of robots (Xu et al., 2020), and employment decisions (Lu et al. 2019; Huang, 2022; Omar et al., 2022). Nevertheless, acknowledging employees' beliefs and perceptions regarding service robots and their potential effect on employment within the hospitality sector is imperative. Hence, the present investigation was formulated to empirically examine a theoretical framework that explores the employee's viewpoint on the unemployment caused by robots from the perspective of the employee's perception of the uptake of robots. The present research is deemed to have addressed the existing gap in the literature and has made a significant contribution towards the development of employment decision-making strategies. The empirical results of the research have also provided valuable practical implications.

2. Literature review

2.1. Robots in hospitality and tourism

Contrary to the overall body of literature on human-robot interactions, studies on the employment of robots in the hospitality and tourism industries are very rare and underdeveloped. The researchers of the two major review papers in the area (Koo, Curtis, & Ryan, 2021; Samala et al., 2022) provide an in-depth analysis of the most recent studies on the utilisation of robots in tourism and lay out a plan for future scholarly investigation on the subject. Most of the research in this area assumes a supply-side approach and is conceptual and exploratory, concentrating on how travel, tourism, and hospitality businesses may employ robots to offer services. Collins et al. (2017), Ivanov et al. (2017), and Gajdos & Marcis (2019), for instance, address the present and prospective future utilization of robots in the tourism industries. Ivanov et al.'s (2017) investigation looks at how hospitality businesses (including bars, restaurants, hotels, etc.) must (re) design their spaces to make them robot accessible. They stress in their report that making buildings robot-friendly would provide hospitality businesses with a novel source of future competitive edge.

The researchers examine the advantages and costs of robot uptake by tourism, travel, and hospitality businesses in a recent work, Ivanov & Webster (2019). The researchers admit that the uptake of robots is influenced by a number of variables, including technological costs and labour, consumer preparedness and desire to use a robot, customer and service provider cultural traits, and the technical qualities of robots. Few empirical studies have been conducted in the area, particularly from a demand-side viewpoint. By empirically examining the worker's view of Robot-Induced Unemployment (RIU) through the lens of the worker's impression of robot adoption in hotels, this study contributes to the existing literature.

2.2. Employees' perception of service robots

In the field of psychology, the term "perception" pertains to judgements of objects of thought that are either favourable or unfavourable. According to Weiten's (2004) perception, an object may have a self-contained impact on our emotions and behaviours towards it, as perceived by an individual. To clarify, the concept of perception might be understood as a people's observable ability for cognitive processing, ethical discernment, emotional recognition, and self-adaptation, as posited by Omar et al. (2022). Perception in the context of robotics refers to the psychological actions taken by service personnel in relation to the acceptance or rejection of robots. More precisely, service workers' attitudes towards utilising robots are determined by their associated values and behaviours (Rantanen et al. 2018; Samala et al., 2022). According to recent research, Koo et al. (2021) found that management's confidence in using and integrating robots in the organisation is reflected in workers' perceptions of robots. His results also imply that how motivated and confident individuals are affects how they see robots. Granulo et al. (2019) and Van Looy (2020) reported comparable results, indicating a notable correlation between workers' perceptions of job security and their attitudes towards the integration of robots in the workplace. The aforementioned discovery implies a negative correlation between the level of assurance in employment stability and the individual's viewpoint regarding the utilisation of robots. Employee communication patterns during human-robot cooperation also reveal how they see robots, claim Luo et al. (2021). Additionally, it was demonstrated that individuals exhibit a preference for engaging in collaborative work with others, as human interaction and cooperation are deemed to be of paramount importance. Employees, however, decide on robots as a substitute when it comes to work. Samala et al. (2022) conducted a literature review on the utilisation of robotic innovations in the context of the COVID-19 epidemic. The researchers discovered that service robots were proposed as a viable alternative to in-person services in various settings, including restaurants, hotels, and airports. This recommendation aimed to enforce social distancing protocols and safeguard both customers and staff members against potential infection. Based on the findings of Omar et al. (2022), it has been observed that the COVID-19 pandemic has had a significant impact on consumer preferences, resulting in a shift towards favouring robot service as opposed to human assistance within the hotel industry. Kim et al. (2021) noted that there are two types of robot users: "robophobes" and "robophiles," where favourable feelings about robots are associated with "robophiles" and unfavourable perceptions of robots are associated with "robophobes," who feel uneasy and intimidated by the progress of robotic technology in the hospitality and tourist industries. Therefore, when deploying service robots in the hospitality industries, the impression of robots may be favourable, negative, or neutral. However, the perspective of employees regarding the utilisation of robots in the hospitality sector holds significant importance (Huang, 2022; Zhao, 2022). In order to understand how people in nine different countries feel about service robots, Travel Zoo ran a worldwide study in 2016. As per the research conducted by Kazandzhieva and Filipova (2019), a significant majority of 80% of the participants hold the belief that the availability of robotic services in the domains of tourism, travel, and the hotel industry is likely to increase in the near future. The general impression is that technical development and the public's view of robots do not indicate that human labour should be replaced by machines. However, according to Ivanov et al. (2017), it is the technological application of task completion with human support.

2.3. Robot induced unemployment

Maynard Keynes introduced the concept of technological unemployment as an economic reality in 1930, and he also predicted that it would eventually affect all of mankind (Keynes, 1930). This idea is now more properly referred to as "robot-induced unemployment." Robots stealing human jobs is known as robotic unemployment. To discover robotic unemployment, Pol and Reveley (2017) developed the R (t + 1) - R(t) > H (t + 1) - H(t) formula, where the proportion of robot-occupied jobs in R(t + 1) exceeds the proportion of human-occupied jobs in H (t + 1). Du and Wei (2021) point out that technological advancements in robotics have a direct effect on unemployment; nevertheless, this impact is less important than that of directness, particularly during and after pandemics. In Keynes' seminal work published in 1930, he posits the existence of a novel affliction, which may be unfamiliar to certain readers but is predicted to garner significant attention in the future. This condition, known as technological unemployment, is anticipated to have far-reaching implications. COVID-19 has been identified as a significant factor contributing to the decrease in employment rates and the concurrent increase in the adoption of robotic technologies (Du and Wei, 2021). Consequently, the idea of a robot that causes unemployment is difficult to grasp. Based on the findings of the Organisation for Economic Co-operation and Development (OECD, 2021), several countries have experienced a rise in their unemployment rates. These countries include Australia, with a rate of 5.70%, the European Union consisting of 27 member states, which recorded a rate of 7.50% in 2020, the United Kingdom with a rate of 5.00%, and the United States with a rate of 6.10%. The yearly average income is revealed to be positively and strongly connected to unemployment when considering social distance and other infectious protective concerns, local labour shortages, and high prices. In contrast, robots introduce proxies' workers in certain sectors and, via their cost-saving mechanism, have a positive and considerable influence on unemployment (Parvez et al., 2021). According to Gajdos & Marcis (2019), the use of robotics and productivity increases have a direct relationship that reduces employment. The difficulties posed by robots might soon affect unemployment and shift certain professions to higher skill levels (Civelek and Pehlivanoglu 2020).

2.4. Perceived Trust

According to Wang et al. (2020), perceived trust refers to an individual's confidence in the dependability of technological systems and their capacity to effectively carry out the activities requested by the individual. It has been shown that perceived trust has a major influence on consumers' inclination to utilise online websites, travel, and self-service hotel technologies

(Luhmann, 1979; Seo & Lee, 2021). According to Mukherjee et al.'s study from 2021, trust influences how two beliefs—perceived utility and ease of use—are regarded. Additionally, research by Lin et al., (2021) showed that people's perceptions of the viability of robots are highly influenced by their faith in technology. However, the level of confidence people have in robots and the information they send determines the guarantee of efficacy individuals get from their interactions with robots (Kolesar & Galbraith, 2000; de Graaf and Ben Allouch 2013; Lin et al., 2021). Park and Stangl (2020) argued that the variable of perceived trust holds considerable importance as a precursor when new technologies are implemented in the hospitality industry. This study employed the perceptions of senior customers regarding the quality, privacy protection, and security of hotel service robots' service or information to establish the concept of perceived trust. In conclusion, it is crucial to consider the elderly's faith in hotel service robots since it might be a significant element. Consequently, the following theories were put forth:

H$_1$: *There is a substantial link between perceived trust of robots and RIU.*

2.5. Perceived Risk

The acceptability of robots depends on both faith in their usage, which is crucial in uncertain conditions, and the perceived danger associated with them. Although there are many different ways to define risk, in the context of the present research, perceived risk refers to how users perceive the degree of uncertainty when their actions have unfavourable effects (Schiffman & Kanuk, 1991; Sohn et al., 2016). According to Zemke et al. (2020), uncertainty and unfamiliarity are substantially correlated with risk perception. When using new technology, consumers may experience a significant amount of psychological risk, including anxiety, reluctance, and even unpleasant emotions. According to this viewpoint, in the case of robots, trust and perceived danger are closely associated (Gretzel, 2016). Trust strengthens the user's faith in technology, reducing the perceived risk associated with any new technology. Thus, trust helps users minimise ambiguity or worry about potential consequences, as well as high levels of risk perception. Internet technology has been studied for its opposing relationship between trust and perceived danger (Seo & Lee, 2021; Huang, 2022). Consequently, the following theories are put forth:

H$_2$: *There is a substantial link between perceived risk of robots and RIU.*

H$_3$: *There is a substantial link between perceived trust and perceived risk of robots.*

2.6. Perceived usefulness

Robots have previously been used for high-volume industrial tasks, such as plastic processing and metal forging. However, as technology advanced, large and small organisations were able to deploy robots due to their cost and simplicity of usage. The TAM model refers to perceived advantage as flexibility; it is assessed as a result of method and imitates the critical inspiration to embrace innovations. To socialise the robot in the service sector in this instance, the robot's benefit is required (Bowen & Morosan, 2018; Civelek & Pehlivanoglu, 2020; Samala et al., 2022). When there is a clear threat to human life during emergencies and catastrophes, the perceived benefit of robots might be highlighted (Luo et al., 2021). The notion of quality is strongly connected with perceived value in the tourism and hospitality industries (Zhong et al., 2020). The utilisation of robots in the tourism sector has become increasingly significant in the aftermath of the pandemic due to the highly contagious nature of COVID-19, which can be easily transmitted through close interactions with unfamiliar individuals (Driessen & Heutinck, 2015). Scientists advised preserving social distance in this case, so do so while offering excellent service. Alternative solutions, such as using service robots, may prevent virus infection while providing services. As a consequence, professionals are open to using robots for all aspects of hospitality services, including check-in, guest welcome, navigation, service delivery, and check-out (Omar et al., 2022). The utilisation of robots in various settings, including transportation, airports, hotels, restaurants, leisure, and scenic regions, for the purpose of executing COVID-19-related tasks, has become increasingly prevalent and well-established (Lin et al., 2021). Based on scholarly investigations, service robots possess a potential advantage over human labourers due to their ability to promptly, reliably, and efficiently modify their behaviour codes. Thus, the proposed hypothesis is the fourth one:

H$_4$: *There is a substantial link between perceived usefulness of robots and RIU.*

2.4.4. Robots awareness

Robotic technology is presently being employed in various industries, such as the restaurant, hotel, and airport sectors. These robots are tasked with a diverse range of responsibilities, including but not limited to the transportation of goods, the provision of concierge services, front-of-house baggage carrying, and back-of-house duties such as cooking, dishwashing, cleaning, and other manufacturing tasks (Luo et al., 2021). In the hospitality and tourism industries, a diverse range of service robots are utilised, such as the mobile application created by vacuum robots for housekeeping, Dishcraft's commercial robotic dishwashers, the “Flippy” robot for hamburger flipping, the “BreadBot” robot for automatic bread production, robotic vending

machines for food and salad preparation, and Royal Caribbean's Bionic Bar (Omar et al., 2022). As per the findings of Ivanov et al. (2017), the utilisation of robots in the hotel industry can be deemed a valuable resource for the company, contributing towards the enhancement of shareholder value and generating favourable financial outcomes. Robotic systems are capable of operating continuously without requiring additional incentives or funding. On the other hand, the management exhibits an inclination towards employing robots in specific job roles owing to the considerable degree of organisational assistance and drive necessitated by employees, alongside diverse requisites such as gratuities, incentives, supplementary remuneration for extra hours at an average of 1.5%, healthcare coverage, an employment authorization, and time off, as indicated by Wang and Wang (2021). Consequently, the utilisation of robots in the workplace engenders heightened employee consciousness. Employees' sense of how much management cares about their developing specialised aims and the bottom line at work might help to reduce turnover (Vatan & Dogan, 2021; Huang, 2022). Skilled workers in the travel, tourism, and hospitality industries are essential assets. Despite the existence of negative perceptions and anxiety surrounding the prospect of working with robots, the integration of robots in service sectors has been found to heighten awareness and anxiety regarding potential job displacement among individuals (Bowen & Morosan, 2018; Gajdos & Marcis, 2019; Civelek & Pehlivanoglu, 2020). As a result, we put forward Hypothesis 5.

H_5: *There is a substantial link between awareness of robots and RIU.*

2.8. Social skills

Customers are interacting more with service robots as they gain popularity among artificial intelligence agents, and social communication assessment is the same appraisal tool for human workers (Ivanov et al., 2017; Koo et al., 2021). Robots are, however, discarded to aid customers or travellers in hospitality tourism and travel by supplying security and safety amenities, automated checking in and out, transporting conveniences, cleaning, and providing instructions (Zhong et al., 2020). Hospitality robots differ from industrial robots in that they have an emphasis on intelligent interactions with both people and other robots, such as chatting, taking turns, showing respect, and gesturing (Kazandzhieva & Filipova, 2019). So, we came up with hypothesis number six:

H_6: *There is a substantial link between the social skills of robots and RIU.*

3. Methodology

Prior to actual data collection, a preliminary investigation was conducted through a pilot study involving a sample of 153 individuals. The sample size was distributed among the measurement items, with 10-15 participants assigned to each item. This pilot study was carried out to make sure that the questionnaire was legitimate (Hair et al., 2017). A person must actively work in the hospitality industry and have had at least one service robot encounter during the last year in order to be eligible to participate. Participants must be at least 18 years old. The pilot test's data collection showed that the survey instrument had good face validity. The data were gathered between February 2023 and April 2023. A survey was created online and disseminated through Facebook. The third scholar, who is a native Arabic speaker, translated the study team's English-language survey into Arabic. To prevent participant fatigue and increase the response rate, researchers made an effort to keep the survey brief and to the point. The online poll took the respondents around 15 minutes to complete. Facebook submitted 450 questions in total. Nevertheless, 401 participants in the final sample were between the ages of 18 and 30. Table 1 lists the attributes of the sample.

Table 1
Sample characteristics.

Variables	Item	No	Percent
Gender	Male	325	81.04
	Female	71	17.70
Age Group	In the 20s	79	19.70
	In the 30s	198	22.69
	In the 40s	91	49.37
	50 and above	33	8.22
Marital Status	Married	231	57.60
	Single	170	42.39
Occupation	Self Employed	71	17.70
	Working for Wages	330	82.29

3. 1. Measures

Questionnaire items, including questions regarding respondents' perceptions of the benefits of utilising service robots, perceived risks of utilising service robots, awareness of service robots, and perceived unemployment caused by robots, were supplied to all participants. The scale elements were evaluated using a 5-point Likert scale, with 1 being the strongest

agreement and 5 being the strongest disagreement. All the questionnaire instruments were modified from previous research as part of the precursory exploration to ensure the validity of the questionnaire items: four questions about perceived usefulness of service robots, two questions about perceived social skills of robots, four questions about robot-induced unemployment, three questions about robot awareness, four questions about perceived trust in service robots, and four questions about perceived risk of service robots were taken from Gretzel (2016), Tung & Law (2017), and Ivanov et al. (2017).

3.2. Data cleaning

By checking the data for skewness and kurtosis, we made sure the data met the normality requirement for multivariate analysis (Hair et al., 2017). We used Westland's (2010) sample adequacy evaluation with our proposed framework, which included 6 latent factors and 20 indicator factors with 0.05 significance at 0.80 statistical power, to determine the sample size's suitability. The minimal sample size, according to Westland's approach, is 227 samples. As a result, according to Westland (2010), our sample size of 401 meets the required minimum sample size for data adequacy. Since the data was gathered through Mturk, it is impossible to determine the response rate in reality. Omar et al. (2022) contend that in circumstances like these, when it is impossible to compute the response rate, it is necessary to provide an explanation of the data's adequacy. Skewness and kurtosis had absolute values that varied from 0.672 to 0.534 and 0.487 to 1.356, respectively. According to Hair et al. (2017), these values are within the permissible range of skewness 3 and kurtosis 8. As a result, the data met the multivariate analysis's requirement for normality. Additionally, a number of methods were used to guarantee the accuracy of the data. According to Westland's (2010) recommendation, the survey included a number of attention-check items. The study excluded the respondents who struggled with these attention-check questions.

3.3.Common method variance.

We used several procedural preventative measures in this work to avoid the problem of technique bias. In order to ensure that the questionnaires were well written and clear, pilot research was first carried out. Second, by employing various cover stories for every questionnaire segment, we developed and established psychological isolation. Additionally, no identity-related inquiries were made, and all respondents received guarantees of anonymity and secrecy. Lastly, we statistically verified our data using Harman's single-variable approach. As a consequence, the results of our non-rotated factor analysis for all six variables revealed that each component accounted for 79% of the variation. According to this outcome, common method variance is not a problem for this investigation. Furthermore, Table 2's inter-construct correlation does not display any correlation values higher than 0.9. According to the greatest inter-correlation of.77, common technique bias is not a significant issue for this research.

Table 2
Correlations Estimates.

	Variables	Square root of AVE	1	2	3	4	5	6
1.	Robot induced unemployment	0.76	1	.41	.49	.38	.55	.67
2.	Perceived Trust	0.87		1	.28	.62	.59	53
3.	Perceived Risk	0.71			1	.45	.33	.25
4.	Perceived usefulness	0.82				1	.77	.37
5.	Robots awareness	0.77					1	.66
6.	Social skills	0.79						1

4. Measurement model

The study employed Confirmatory Factor Analysis (CFA) to investigate the validity of the Moments of Structure (AMOS) version 21 scale, specifically assessing its convergent and discriminant validity. The CFA aimed to condense a total of 20 components into 6 constructions. The dependability of the six components utilised in the investigation exceeded 0.6, as indicated in Table 2. Fornell and Larcker (1981) evaluated discriminant validity by comparing the correlations of the constructs with the square root of AVEs. To establish the presence of discriminant validity, it is necessary for the square root of the Average Variance Extracted (AVE) to surpass the correlation estimates of the constructs. Table 2 illustrates that the square root of Average Variance Extracted (AVEs) exhibited a greater magnitude compared to the correlation estimates. The accuracy of our scale was verified. The suggested model's model fit statistics provide additional support for the appropriateness of our measurement model for structural analysis. The obtained result indicates that the ratio of chi-square to the degree of freedom was 4.21, which falls below the upper threshold value of 5. Additionally, the comparative fit index (CFI) was found to be equal to y. The CFA aimed to condense a total of 20 components into six constructions. The dependability of the six components utilised in the investigation exceeded 0.6, as indicated in Table 2. Fornell and Larcker (1981) evaluated discriminant validity by comparing the correlations of the constructs with the square root of AVEs. To establish the presence of discriminant validity, it is necessary for the square root of the average variance extracted (AVE) to surpass the correlation estimates of the constructs. Table 2 demonstrates that the square root of Average Variance Extracted (AVEs) exhibited a

greater numerical value in comparison to the correlation estimations. Verification of the accuracy of our scale was accomplished. The suggested model's model fit statistics provide additional support for the appropriateness of our measurement model for structural analysis. Kazandzhieva and Filipova (2019) reported that the chi-square (x2) to degree of freedom (df) ratio was 4.21, which falls below the upper threshold value of 5. Additionally, the comparative fit index (CFI) was.95, the Tucker-Lewis fit index (TLI) was.89, the root mean square error of approximation (RMSEA) was.06, and the standardised root mean square residual (SRMR) was.07, all of which indicated a satisfactory model fit. A person's view of robot-induced unemployment is considerably influenced by perceived trust, according to Table 3's results (r = 0.20, p = 0.000) and (= 0.062, t = 0.798, p = 0.000); hence, hypothesis 1 is accepted. Similar to how perceived risk affects people's perceptions of robot-induced unemployment, hypothesis 2 is accepted (r = 0.29, p = 0.000) (= 0.049, t = 1.226, p = 0.000). The empirical findings, on the other hand, indicated that perceived trust considerably and favourably influences perceived danger in robots (r = 0.37, p = 0.000) (= 339, t = 3.501, p = 0.000); hence, hypothesis 3 is accepted. A person's perspective of robot-induced unemployment is not substantially influenced by their view of perceived usefulness (r = 0.36, p = 0.13; = 0.073, t = 0.803, p = 0.347); hence, hypothesis 4 is rejected. Hypothesis 5 is accepted because the knowledge and trust variables substantially affect people's perceptions of robot-induced unemployment (r = 0.41, p = 0.000; = 0.077, t = 0.866, p = 0.000). Hypothesis 6 is accepted because social skills have a substantial impact on a person's impression of robot-induced unemployment (r = 0.41, p = 0.000) and (= 0.088, t = 0.249, p = 0.000).

Table 2
Factor analysis.

Variable	SL	CR	AVE	α
Robot induced unemployment		.58	.39	0.88
1UN	.71			
2UN	.78			
3UN	.76			
4UN	.85			
Perceived Trust		.79	.68	.89
1PT	.87			
2PT	.81			
3PT	.73			
4PT	.70			
Perceived Risk		.74	.79	.92
1PR	.84			
2PR	.67			
3PR	.76			
Perceived usefulness		.77	.72	.93
1PU	.63			
2PU	.78			
3PU	.80			
4PU	.85			
Awareness		.80	.57	.91
1A	.57			
2A	.75			
3A	.68			
Social skills		.70	.55	.84
1S	.88			
2S	.79			

Table 3
Result of hypotheses testing.

	Std. Beta	Std. Error	T-values	P-values	Decision
H1	0.062	0.057	0.798	0.000	Supported
H2	0.049	0.059	1.226	0.000	Supported
H3	0.339	0.050	3.501	0.000	Supported
H4	0.073	0.049	0.803	0.347	Not-supported
H5	0.077	0.041	0.366	0.000	Supported
H6	0.088	0.048	0.249	0.000	Supported

5. Discussion and conclusion

Bowen and Morosan (2018) emphasise that there is a persistent inclination among older individuals to embrace technology. This observation implies that the impact of advanced technologies, such as robots, on the everyday experiences of the elderly is progressively expanding, and the probability of integrating these technologies into their daily routines is also increasing. To address the challenges posed by a labour shortage resulting from demographic shifts and unforeseen pandemics, the hospitality service sector, specifically hotels, must adapt its technological infrastructure and service delivery frameworks (Parvez et al., 2022). Social robotics has become a viable option for supporting or maybe taking the place of people in service delivery in the face of hazy global health crises like COVID-19. Service robots have undoubtedly steadily made their way into the hotel and hospitality service sector as an emerging technology to provide services to consumers. Users are less inclined to utilise robots as part of the customer support process, nevertheless (Koo et al., 2021). In addition to developing and demonstrating a hotel service robot acceptance model, this research attempts to identify the elements that influence older guests' intent to employ hotel service robots. The findings indicate that empathy in the emotional domain and perceived trust, value, utility, and simplicity of use in the cognitive dimension had a favourable influence on older guests' inclination to employ robot services in hotels. Robot induced unemployment, perceived trust, perceived risk, robot awareness, and social skills were among those that had a direct effect on intention to use; perceived trust also had an indirect effect by favourably impacting perceived usefulness and perceived ease of use. Additionally, perceived ease of use had a favourable influence on usefulness, which in turn indirectly affected the intention to use. The findings of the study will contribute to a better knowledge of how senior citizens interact with hotel service robots, expand the theory of senior citizen user behaviour, and provide theoretical direction for the creation, administration, and promotion of hotel service robots. Future travel, tourism, and hospitality depend critically on technology, sustainability, and managerial vision. The tourism sector has to continually adapt robots to client requests in order to remain viable in a highly competitive business environment. Additionally, the current environment necessitates the employment of robots for information guidance (Chatbots, robot assistants), sanitization (killing germs and viruses), and service (food and beverages). In order to restore the tourist industry's reputation following the coronavirus crisis, the hospitality and tourism sectors should prioritise overcoming robotics. Additionally, service robots could enable workers to be more skilled and do operator-level tasks. This emerging trend has the potential to achieve long-term success and sustainability while creating a new identity for the hotel and tourism sectors. This research adds fresh theoretical implications to the literature on the perception of robots and robot-induced unemployment among workers in the hospitality industry. By combining employee views of service robots with robots promoting unemployment, this study developed a research framework. Following the COVID-19 effect, the introduction of service robots has recently affected how customers, workers, and technical advancements are seen (Civelek & Pehlivanoglu, 2020; Kim et al., 2021; Lin et al., 2021; Wang & Wang, 2021). The primary theoretical contribution of this research is the presentation of a literature-based service robot inquiry for organisational decision-making on service robot adoption practises in the tourism and hospitality industries. Zhao and colleagues (2022) encourage a thorough literature review of robotic technology used during the COVID-19 epidemic. The addition of intelligent robots to business processes and employee perception analysis were the subjects of a study by Zhong et al. (2020). Similar to this, Vatan and Dogan (2021) conducted qualitative research in Turkey on hotel staff members' opinions about the use of service robots. For academics in the fields of tourism and hospitality, as well as other relevant authorities, the present study provides an important foundation for understanding current service robot research trends. This paradigm enables a thorough study path while enhancing the theoretical underpinnings of robotic acceptability and the intensity of service robot adoption. Although the use of service robots within the travel and hospitality sectors addresses a number of challenges for organisational decision-making, there are still a number of issues that need to be resolved. Through the consolidation of the existing research agenda, our work addresses this gap. Additionally, the study's results demonstrate the effects of workers' perceptions on commercial decision-making outcomes among guest service departments, human resource management, marketing, and finance. The perspectives of consumers, workers, and management have changed as a result of COVID-19 and technological advancement. Managers pay close attention to the customers' need for service robots and the workers' intentions towards robots in their organisations due to their efficacy and expansion in multiple service sectors, tourism, and hospitality sectors (Gajdos & Marcis, 2019; Kim et al., 2021). As far as mechanical objects like artificial intelligence, machine learning, and virtual reality are concerned, chatbots complete a task more precisely and at a lower cost when compared to their human counterparts' robotic devices in complex front-line tasks (Gretzel, 2016; Ivanov & Webster, 2019; Parvez, 2020). However, for any innovation to be successful, effective customer support is essential. Despite the outstanding achievements, this work includes a few shortcomings that point to areas for further investigation. because there aren't many restrictions worth discussing given the methods used. Despite the fact that several studies have shown that robots can recognise advantages, perceived disadvantages, perceived awareness, intended usage, and actual use are often closely associated with how robots are regarded. Because of COVID-19's initial dispersion, it was unable to gather information from travel and tourist organisations. As a result, MTurk (USA) was used to gather the study's data. Therefore, data from the organisations themselves might be obtained for future studies. Additionally, hiring solely English-speaking staff members. A further weakness of the research was the fact that many individuals failed to disclose their current employment circumstances. Because we did not distinguish between job levels in this study, the replies from entry-level, skill-level, and supervisor-level personnel could not be distinguished. Future research in this area may take into account the employment level and determine each individual's intention towards service robots in their organisation.

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