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REVISTA TURISMO y SOCIEDAD

SERVICE ROBOTS IN HOTEL BUSINESSES: A MIXED METHOD STUDY

ROBOTS DE SERVICIO EN HOSTELERÍA: UN ESTUDIO DE MÉTODO MIXTO

Abstract

The aim of the research is to determine the willingness and perspectives of the employees of the five-star hotel business in Nevşehir, Turkey, regarding service robots by using a mixed method. 396 questionnaires were obtained with the convenience sampling method. In addition, the purposeful sampling method was adopted in the study, which was designed as a case study, and 12 people were interviewed. The research findings were revealed by making difference analyzes and descriptive analyzes. It has been determined that hotel employees are relatively willing to work with service robots. Employees focused more on the performance and convenience of service robots. Some employees stated that service robots will show human-like features physically, but they cannot replace humans due to the labor-intensive nature of tourism. On the other hand, it has been concluded that with the achievement of the service standard, they will play an important role in reducing errors and increasing service quality.

Keywords: service robots, hotel employees, mixed-method, Cappadocia, Nevşehir, Turkey

Resumen

El objetivo de la investigación es determinar la voluntad y las perspectivas de los empleados de hoteles de cinco estrellas en Nevşehir, Turquía, con respecto a los robots de servicio. En el estudio se utilizó un método mixto: se obtuvieron 396 encuestas por el método de muestreo por conveniencia; además, se adoptó el método de muestreo intencional, que fue diseñado como un estudio de caso, y se entrevistó a 12 personas. Los hallazgos de la investigación se revelaron mediante la realización de

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análisis de diferencias y análisis descriptivos. Se ha determinado que los empleados del hotel están relativamente dispuestos a trabajar con robots de servicio. Los empleados se centraron más en el desempeño y la conveniencia de los robots de servicio. Algunos trabajadores afirmaron que, aunque los robots de servicio tengan características físicas similares a las humanas, no pueden reemplazar a los humanos debido a la naturaleza intensiva en mano de obra del turismo. Por otro lado, se ha concluido que con el logro del estándar de servicio se jugará un papel importante en la reducción de errores y en el aumento de la calidad del servicio.

Palabras clave: robots de servicio, personal del hotel, método mixto, Capadocia, Nevşehir, Turquía

1. Introduction

All living spaces of humans are in transformation in parallel with technological development (Organisation for Economic Co-operation and Development [OECD], 2008). Depending on the technology, developments in robot technology have enabled robots to enter working life (Özkan et al., 2020) and they have begun to appear in the tourism industry (Gladstone, 2016). It is estimated that robots will have constituted approximately 25% of the tourism and hospitality industry (Lashley, 2008) by 2030 (Bowen & Morosan, 2018). According to the research about *The Future of Employment*, supported by the World Economic Forum, it is revealed that restaurant and cafe waiters are the professions with the highest computerization and robotization among 702 professions (Fırat & Fırat, 2017).

There are examples in the world that service robots are used in the tourism and hospitality industry (Ohlan, 2018; Osawa et al., 2017; Trejos, 2014; Trejos, 2016; TurizmGüncel.com, 2016). Turkey is also a country that develops and adapts to technological innovations (T.C. Sanayi ve Teknoloji Bakanlığı, 2019). Employing a robot waiter at Touch, a restaurant in Istanbul, having consultant robots at the Istanbul airport, using a receptionist robot at Limak Limra Kemer are examples of using service robots in tourism in Turkey (CNNTÜRK, 2019). On the other hand, robots take the place of humans in various business tasks that have the effect of worsening the living standards of employees (Yılmaz, 2018). In addition, it can be a serious concern for people that the potential of robotization in tourism may increase unemployment (Özgürel & Şahin, 2021). Therefore, it is significant to analyze and understand the acceptance of employees for service robots in order to improve human-robot interactions (McCartney & McCartney, 2020) to evaluate the consequences of this transformation for employees, and to reveal the willingness and readiness for these consequences (Eberl, 2019).

Based on the relevant literature, comprehending the opinions and emotions of employees in the industry about service robots made it necessary to carry out this research. As the research was applied to the employees in tourism (T.C. Strateji ve Bütçe Başkanlığı, 2019), which has an important place in the Turkish economy, and few number of research have been carried out on this subject, the research could make a significant contribution to the literature. In addition, the analysis of the service robot variable, used in the research, and the determined themes, created using the statistical program, can be considered as

methodological contributions. This research set out to determine the willingness and perspectives of the employees and managers working at five-star hotels about service robots. For this purpose, a survey study was conducted, and then qualitative research methods were used by interviewing both the employees and the managers in order to support the quantitative study and to gather detailed information so that the mixed method was used, and a holistic result was presented by comparing the quantitative findings and qualitative perspectives.

2. Theoretical background

In this research, the technology acceptance model of Davis (1989), an improved version of the theory of reasoned behavior (Ajzen & Fishbein, 1980), was employed in order to interpret the concept of integration willingness to service robots. According to the model, the intentions of the individuals determine the use of technology. Individuals adopt the technology by evaluating the relationships between perceived ease of use, usefulness, and intentions (Davis, 1989). One of the innovations, as a result of developing technology and digitalization in every district in life, is service robots (Yelkikalkan et al., 2019). Service robots are described as "agents with artificial intelligence that are physically embodied and can perform actions affecting the physical world" (Bowen & Morosan, 2018, p. 727). They are responsible for human-like services, interactions, and improving customer experiences; so, they provide an advantage to enterprises for sustainable competitiveness (Kuo et al., 2017).

Service robots, in the tourism and hospitality industry, have started to exist because of the advantages they provide such as improving the services of enterprises, offering consistent product quality (Ivanov et al., 2017), reducing purchased costs, increasing competitiveness. Service robots have a facilitating and benefit-enhancing effect in the hospitality industry. As the benefit from service robots increases, the satisfaction improves, thus service robots are designed regarding customer satisfaction (Gürdin, 2020). Moreover, the fact that robots can work 24/7, perform complex tasks simultaneously and correctly, cannot complain, show negative emotions, or loaf around are regarded as some of the advantages of robots (Ivanov, 2016). However, it is accepted as a disadvantage that robots are lack of creativity, need a guide in planning the work, and are perceived as a threat in terms of the employees (Ivanov, 2017).

In this industry, they are utilized for cleaning rooms, delivering goods, handling luggage, cooking, and cleaning at hotels, restaurants, and airports (Devitt, 2019; Ivanov et al., 2017; İbiş, 2019). For instance; service robots are employed as receptionists and bellboy at the front desk (Ohlan, 2018) at Henn-na, the first robot hotel in Nagasaki (Osawa et al., 2017); as a concierge robot named Connie at Hilton Hotels (Trejos, 2016); as a front desk information robot named Mario at Mariott Hotel in Belgium (TurizmGüncel.com, 2016); as a maid named A.L.O. at Aloft Hotel Cupertino (Trejos, 2014); as a delivery robot named Dash at Crown Plaza (Yalçın Kayıkçı & Kutluk Bozkurt, 2018); and as a bellboy named Yobot at New York Hotel (Social Tables, 2019).

Despite this widespread use of service robots in the tourism and hospitality industry, studies on service robots focused mainly on the perceptions of tourists and employees on robots,

including human-robot interaction (Choi et al., 2020; Nakanishi et al., 2020; Tung & Law, 2017), the impact of robots on tourist behavior (Tussyadiah & Miller, 2019), the willingness of customers to use service robots in tourism (Lu et al., 2019), intention to utilize service robots (Ivanov & Webster, 2019), the relationship between service robots and customer (Ho et al., 2020), tourist behavior towards service robots (Ivanov, Webster, & Seyyedi, 2018; Tussyadiah et al., 2020), the satisfying effect of human-like robots (Nakanishi et al., 2018) and attitudes towards the use of robots (Ivanov, Webster, & Garenko, 2018).

There are studies on the interaction of employees with service robots in the tourism and hospitality industry (Li et al., 2019; Tuomi et al., 2020; Yu, 2020); however, a study analyzing the willingness of employees to integrate service robots with a mixed method had not been carried out. In the research, it was tried to determine the differences in the willingness of employees about service robots in terms of demographic variables. It was predicted that the willingness about service robots would vary in terms of the position, education level, experience, and department of the employees. The hypotheses established within the scope of the research were given below.

H1: There is a significant difference in the willingness of the employee to use a service robot in terms of the position.

H2: There is a significant difference in the willingness of the employee to use a service robot in terms of the education level.

H3: There is a significant difference in the willingness of the employee to use a service robot in terms of the experience.

H4: There is a significant difference in the willingness of the employee to use a service robot in terms of the department.

Although there are studies on the willingness towards service robots (Lu et al., 2019; Ivanov & Webster, 2019), it is also known that qualitative studies on how hotel employees feel about working with service robots are insufficient (Vatan & Doğan, 2021). Therefore, it became necessary to examine the perspectives of hotel employees on the use of service robots in a detailed manner. The interview questions were given below.

1. What do you think about the performance of service robots used in accommodation establishments?

2. How does the use of service robots in accommodation establishments contribute fun/pleasure to service delivery?

3. What do you think about the human-like features of service robots?

4. How does the use of a service robot in accommodation establishments affect social relations?

5. What do you think about the conveniences provided by service robots in accommodation establishments?

6. What are your feelings about the use of service robots in accommodation establishments?

3. Method

In this research, mixed-method, which is the intentional and systematic use of qualitative-quantitative approaches and methods in a single study and enables a holistic evaluation of the results obtained qualitatively and quantitatively, was adopted (Maxwell, 2016).

3.1 Quantitative method

The population of the research consisted of employees of five-star hotels in Nevşehir. Nevşehir is called as the core Cappadocia and is accepted as one of the world-renowned tourism centers (Karakuş, 2022; Unesco, 2021). It is a tourism destination that has maintained continuous tourism development since the 1980s and hosts guests from a wide variety of countries (Tosun et al., 2021). Thus, Nevşehir is accepted as one of the most suitable tourism regions for carrying out the research. According to the information obtained from Nevşehir Provincial Directorate of Culture and Tourism, the number of five-star hotels in Nevşehir was determined as seven (T.C. Nevşehir İl Kültür ve Turizm Müdürlüğü, 2021). A sampling method was applied, and 420 questionnaires were collected by using the convenience sampling method. However, 396 questionnaires were analyzed in the research. Most of the questionnaires were collected in person in July and August 2021.

In the research, 69.2% (*n*=274) of the participants were male and 30.8% (*n*=122) were female. Most of the participants, as 50.5% (*n*=200), were between the ages of 31-40. It was identified that 46.5% (*n*=184) of the participants were high school graduates; 79.8% of them (*n*=316) earned a monthly income between 2500-4000 TL; and 43.2% of them (*n*=171) worked in the tourism industry for more than 11 years. In addition, 78.3% (*n*=310) of the participants were employees; 21.7 (*n*=86) were managers; and the highest participation was provided by the food and beverage department with 48.2% (*n*=191).

In order to measure the willingness of employees to use service robots, *Service Robot Integration Willingness (SRIW) Scale*, developed by Lu et al. (2019), was utilized. The scale consisted of 6 factors and 36 items as performance efficacy (7 factors), intrinsic motivation (6 factors), anthropomorphism (7 factors), social influence (7 factors), facilitating conditions (4 factors), and emotions/affects (5 factors). The statements in the Likert-type scale were ranked from (1) *strongly disagree* to (5) *strongly agree*.

Research data were analyzed using SPSS and AMOS analysis programs. On account of assessing the participation level of the employees, frequency, percentage, arithmetic mean and standard deviation were examined. In regard to the validity and reliability of the measurement tool, EFA, CFA, convergent and discriminant validity and Cronbach's alpha were evaluated. After controlling the assumption of normality of the data, t-Test and Anova were performed to determine the differences between the participants.

3.2 Qualitative method

Within the framework of the qualitative method, the research problem was primarily determined, and answers to the question "*What are the perspectives of hotel employees about service robots*?" led the research. The case study was adopted as the research design. The purposive sampling method was benefited while choosing the participants. Semi-structured interviews were conducted with six managers and six employees in August 2021. A voice recorder was used with the permission of the interviewers, and the interviews lasted an average of 40 minutes. It was inferred that the interviews should not be continued because of the repetition of the research data (Creswell, 2018; Yıldırım & Şimşek, 2013). Accordingly, as a result of the interview with the twelfth participant in the research, it was noticed that the data started to be repeated and the interviews were terminated due to data saturation. Deductive and inductive methods were used for processing data. The analysis of the obtained data was carried out through frequency analysis as one of the content analysis types. For the systematic analysis of the data, the "*MAXQDA 20*" qualitative data analysis program was preferred. The use of the program contributed to increasing the validity and reliability of the research. In addition, a consensus was reached between the coders, and the research was carried out by complying with the criteria of credibility, transferability, consistency, and confirmability.

4. Results

4.1 Quantitative findings

In order to identify the construct validity of the scales, exploratory factor analysis (EFA) was performed using principal component analysis and the direct oblimin axis rotation technique. As a result of EFA, a six-factor structure was obtained in accordance with the original structure of the service robot integration willingness scale (Table 1). However, an expression of the performance efficiency factor was excluded from the scale as it was loaded under a different factor. The total explained variance rate for the scale was determined as 81.132.

Table 1. EFA and CFA results

	EFA		*CFA*			
Factors/Items	*Factor Loading*	*Variance (%)*	*Factor Loading*[a]	*AVE*	*CR*	*Cronbach's Alpha*
Factor 1: Performance Efficacy		11.327		.84	.97	.97
PE1	.930		.924			
PE2	.943		.944			
PE3	.924		.952			
PE4	.927		.948			
PE5	.906		.893			

	EFA		*CFA*			
Factors/Items	*Factor Loading*	*Variance (%)*	*Factor Loading*[a]	*AVE*	*CR*	*Cronbach's Alpha*
PE6	.807		.838			
Factor 2: Intrinsic Motivation		5.272		.72	.94	.94
IM8	.715		.846			
IM9	.780		.909			
IM10	.828		.943			
IM11	.793		.894			
IM12	.753		.793			
IM13	.644		.679			
Factor 3: Anthropomorphism		15.479		.64	.93	.93
A14	.661		.752			
A15	.630		.746			
A16	.756		.845			
A17	.887		.887			
A18	.912		.823			
A19	.914		.790			
A20	.879		.749			
Factor 4: Social Influence		33.942		.78	.96	.96
SI21	.911		.905			
SI22	.915		.924			
SI23	.898		.928			
SI24	.862		.894			
SI25	.857		.891			
SI26	.835		.842			
SI27	.785		.810			
Factor 5: Facilitating Conditions		5.953		.77	.93	.92
FC28	.918		.946			
FC29	.948		.937			
FC30	.968		.923			
FC31	.759		.687			
Factor 6: Emotions/Affects		9.160		.75	.94	.94

	EFA		*CFA*			
Factors/Items	*Factor Loading*	*Variance (%)*	*Factor Loading*[a]	*AVE*	*CR*	*Cronbach's Alpha*
E32	.855		.839			
E33	.874		.893			
E34	.908		.903			
E35	.937		.860			
E36	.895		.831			

Note: [a] All-factors-loadings are significant at $p<0.001$; *NFI* = Normed Fit Index, *IFI* = Incremental Fit Index, *TLI* = Tucker-Lewis Index, *CFI* = Comparative Fit Index, *RMSEA* = Root Mean Square Error of Approximation, *SRMR* = Standardized Root Mean Square Residual
Goodness-of-fit statistics: x^2=1558.568, *df*=535, x^2/df=2.913, *NFI*=.908, *IFI*=.938, *TLI*=.930, *CFI*=.937, *RMSEA*=.070, *SRMR*=.055

Table 1 exhibited the results of the measurement model. CFA results, obtained through the maximum likelihood estimation method, indicated that the six-factor model with 35 items complied with the data (x^2=1558.568, *df*=535, x^2/df=2.913, *NFI*=.908, *IFI*=.938, *TLI*=.930, *CFI*=.937, *RMSEA*=.070, *SRMR*=.055) (Byrne, 2016).

After testing the suitability of the measurement model, the convergent and discriminant validities of all factors were examined, and then the construct validity was specified. Convergent validity was assessed by the average variance extracted (AVE). Table 1 presented that all factor loads in the measurement model were between .952 and .679, significant at the .001 level, and above the critical value of .50 (Hair et al., 2013). Besides, AVE values ranged from .84 to .64 and are higher than the .50 threshold value, which supported convergent validity (Fornell & Larcker, 1981).

Table 2. Correlation coefficients between factors and means

	1	*2*	*3*	*4*	*5*	*6*	*Means*	*Standard Deviation*
Performance Efficacy (1)	**.92***						3.27	1.08
Intrinsic Motivation (2)	.590	**.85***					3.57	.76
Anthropomorphism (3)	.056	.213	**.80***				1.70	.69
Social Influence (4)	.410	.493	.035	**.89***			3.87	.87
Facilitating Conditions (5)	.111	.165	.155	.314	**.88***		3.27	.12
Emotions/Affects (6)	.283	.382	.008	.481	.031	**.87***	3.75	.71

*The square root of the AVE

The discriminant validity was evaluated using the Fornell and Larcker (1981) criterion. According to Table 2, the square root of AVE was greater than the correlation coefficient between each pair of constructs. Thus, it could be inferred that six factors in the

measurement model measure different constructs, and all of them had discriminant validity (Fornell & Larcker, 1981). The reliability of the scales was tested using both Cronbach's alpha and composite reliability (CR) values. As illustrated in Table 1, Cronbach's alpha values ranged from .97 to .92, while CR values were at the lowest level of .93 and were greater than the recommended criterion of .70 (Fornell & Larcker, 1981).

For the purpose of identifying the service robot integration willingness levels of the employees participating in the research, descriptive statistics were performed on the basis of sub-dimensions (Table 2). In consequence of the analysis, it was found out that the employees showed a relatively high level of participation in the dimensions of performance efficacy (3.27), intrinsic motivation (3.57), social influence (3.87), facilitating conditions (3.27), and emotions (3.75); on the contrary, they had a low level of participation in the anthropomorphism (1.70) dimension.

Prior to the difference analysis, the data were analyzed whether they showed normal distribution or not. Regarding the results of the analysis, the skewness values of the data were found to be between -.360 and .973; and the kurtosis values were between -.912 and .668. Accordingly, as the statistical values obtained were between ±1, the data complied with the assumption of normality (Hair et al., 2013).

Independent sample T-Test and Anova test were conducted in order to reveal whether there was a difference in the service robot integration willingness of the employees in terms of demographic characteristics. Moreover, the Tukey test was applied to decide the groups in which the difference occurred. In this context, the results of the difference analysis considering the position, education level, experience, and department features were included.

Table 3. T-Test results in terms of the position of personnel

Factors	*Position*	*Means*	*Standard Deviation*	*t*	*p*
Performance Efficacy	Manager	3.25	1.16	-.178	.859
	Employee	3.27	1.06		
Intrinsic Motivation	Manager	3.56	.76	-.065	.948
	Employee	3.57	.76		
Anthropomorphism	Manager	1.71	.74	.250	.802
	Employee	1.69	.68		
Social Influence	Manager	3.83	.83	-.467	.641
	Employee	3.88	.88		
Facilitating Conditions	Manager	2.97	1.13	-2.869	.004*
	Employee	3.36	1.10		
Emotions/Affects	Manager	4.13	.72	5.724	.000**
	Employee	3.64	.68		

*p<0.05, **p<0.001

According to the independent sample T-Test results given in Table 3; it was suggested that the level of participation of the employees in the facilitating conditions was significantly higher than the managers (p<0.05). On the other hand, the level of participation of the managers regarding the emotion dimension was higher than that of the employees (p<0.001). However, no significant differences were detected between employees and managers regarding performance efficacy, intrinsic motivation, anthropomorphism, and social influence (p>0.05). According to these results, the H1 hypothesis was partially accepted.

Table 4. Anova results in terms of education level

Factors	*F*	*P*	*High School*[a]	*Two Year Degree*[b]	*Bachelor's Degree*[c]	*Tukey*
Performance Efficacy	2.559	.079	3.36	3.24	2.93	-
Intrinsic Motivation	2.064	.128	3.64	3.48	3.63	-
Anthropomorphism	.293	.746	1.72	1.67	1.69	-
Social Influence	2.124	.121	3.97	3.78	3.82	-
Facilitating Conditions	13.674	.000**	3.36	3.36	2.37	a, b > c
Emotions/Affects	5.440	.005*	3.73	3.69	4.12	c > a, b

*p<0.05, **p<0.001

In Table 4, it was evaluated whether the attitudes of the participants on the dimensions differed in terms of their education level. When the significance levels (p>0.05) for performance efficacy, intrinsic motivation, anthropomorphism, and social influence were examined, it could be said that there were not any differences in terms of education level. In the dimensions of facilitating conditions (p<0.001) and emotions (p<0.05), there were differences in terms of education level. Regarding these results, the H2 hypothesis was partially accepted. The groups with differences were presented under the Tukey test in Table 4.

Table 5. Anova results in terms of experience

Factors	*F*	*P*	*Less Than 1 Year*[a]	*1-5 Years*[b]	*6-10 Years*[c]	*More Than 11 Year*[d]	*Tukey*
Performance Efficacy	6.136	.000**	2.94	2.94	3.24	3.50	d > b
Intrinsic Motivation	8.599	.000**	3.11	3.30	3.58	3.75	c, d > b
Anthropomorphism	3.261	.022*	1.64	1.75	1.83	1.58	c > d
Social Influence	7.405	.000**	3.30	3.61	3.82	4.08	d > b
Facilitating Conditions	.914	.434	2.70	3.26	3.37	3.23	-
Emotions/Affects	21.178	.000**	2.90	3.46	3.63	4.03	d > a, b, c c > a

*p<0.05, **p<0.001

In Table 5, whether the attitudes of the participants on the dimensions differed in terms of the experience was examined. In the facilitating conditions (p>0.05) dimension, there were no differences in terms of experience; however, there were differences in the dimensions of performance efficacy (p<0.001), intrinsic motivation (p<0.001), anthropomorphism (p<0.05), social influence (p<0.001) and emotions (p<0.001). According to these results, hypothesis H3 was partially accepted. The groups with differences were presented under the Tukey test in Table 5.

Table 6. Anova results in terms of department

Factors	*F*	*P*	*Front Office*[a]	*F&B*[b]	*House-keeping*[c]	*Other (Tech. Ser., Security)*[d]	*Tukey*
Performance Efficacy	.751	.522	3.18	3.23	3.35	3.42	-
Intrinsic Motivation	.925	.429	3.62	3.50	3.65	3.62	-
Anthropomorphism	8.003	.000**	1.53	1.65	1.69	2.07	d > a, b, c
Social Influence	3.473	.016*	4.01	3.87	3.97	3.57	a, c > d
Facilitating Conditions	3.686	.012*	3.00	3.40	3.44	3.05	b > a
Emotions/Affects	6.241	.000**	4.00	3.63	3.68	3.88	a > b, c

*p<0.05, **p<0.001

In Table 6, whether the attitudes of the participants on the dimensions differed in terms of departments was examined. When the significance levels of performance efficacy and intrinsic motivation dimensions were analyzed (p>0.05), it was found that there were no significant differences in terms of the department. On the other hand, there were differences in terms of the department in the dimensions of anthropomorphism (p<0.001), social impact (p<0.05), facilitating conditions (p<0.05) and emotions (p<0.001). According to these results, hypothesis H4 was partially accepted. The groups with differences were presented under the Tukey test in Table 6.

4.2 Qualitative findings

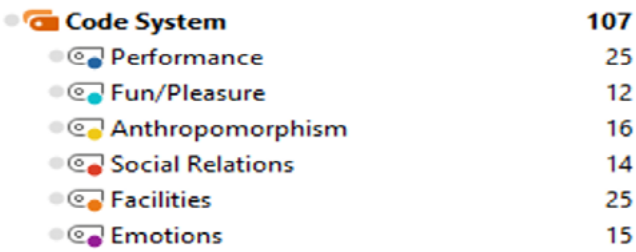
Within the scope of the research, hotel employees were interviewed, and the findings were presented descriptively. The participants were given codes as P1, P2, P3 … P12. After the demographic information, the code system, showing the themes and code numbers of the research, was included. Afterward, the code theory model, word frequency analysis, word cloud, and document portrait analyzes were conducted.

Table 7. Demographic findings regarding participants

Participant	*Gender*	*Age*	*Education Level*	*Income (TL)*	*Industry Experience*	*Position*	*Department*
P1	Male	More Than 51	High School	More Than 7001	More Than 11	Manager (General Manager)	-
P2	Female	31-40	Bachelor's Degree	4001-5500	More Than 11	Manager	Human Resources
P3	Male	41-50	High School	5501-7000	More Than 11	Manager	F&B
P4	Male	31-40	High School	4001-5500	More Than 11	Employee	F&B
P5	Male	31-40	High School	2500-4000	6-10	Manager	F&B
P6	Female	21-30	Postgraduate	4001-5500	1-5	Employee	Front Office
P7	Female	41-50	Primary School	2500-4000	More Than 11	Manager	Housekeeping
P8	Male	31-40	High School	2500-4000	6-10	Employee	Accounting
P9	Male	21-30	High School	2500-4000	6-10	Employee	F&B
P10	Female	Less Than 20	High School	2500-4000	1-5	Employee	F&B
P11	Male	21-30	Postgraduate	5501-7000	More Than 11	Manager	Front Office
P12	Female	31-40	Postgraduate	4001-5500	6-10	Employee	Front Office

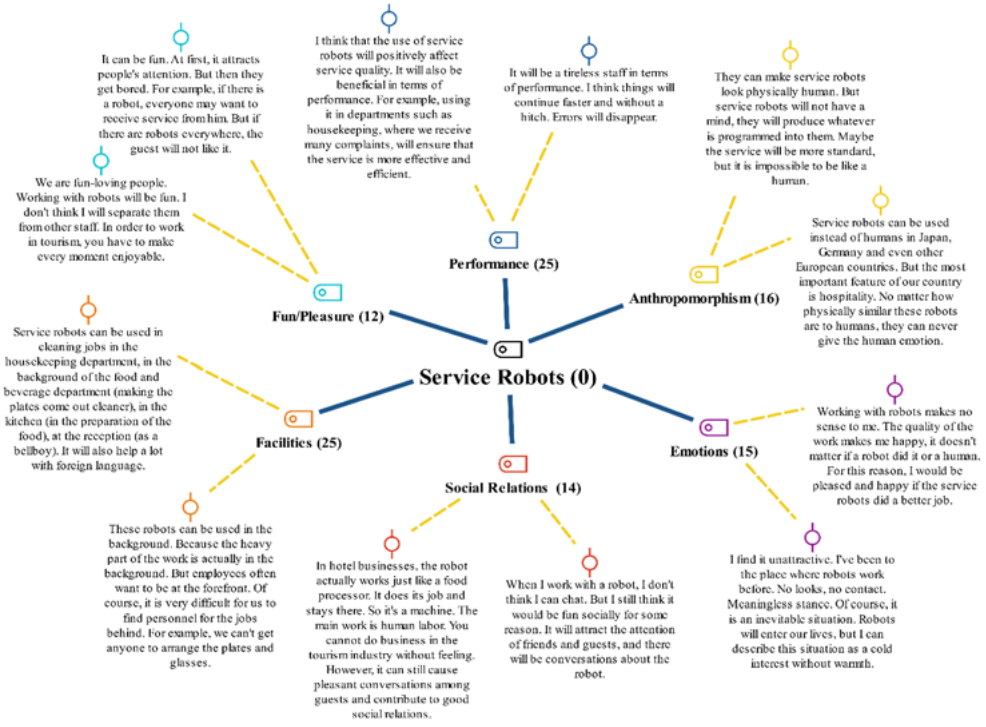
Table 7 showed the demographic characteristics of the employees. It was seen that most of the participants were male, the numbers of employees who were between the ages of 31-40 and high school graduates were higher. In addition, it was observed that six managers and six employees from different departments, with different income levels and working hours, participated in the research.

Figure 1. Code system for service robots



As a result of the interviews, some data were collected and decoded. The themes and codes were determined through the program. At this stage, both closed and open code systems were used. In the scope of the research, 6 main themes were specified. Performance, fun/enjoyment, anthropomorphism, social relations, facilities, and emotions were the main themes. In line with the data, 107 coding were made in total. Figure 1 showed the code system, and Figure 2 showed the participant comments on each determined theme.

Figure 2. Code-theory model of service robots



Code-theory model analysis exhibits the main themes created for service robots and comments. While talking about service robots, employees mostly mentioned the theme of performance (25) and convenience (25). Most of the employees stated that the service robots would be fast and practical, they would affect the service quality in a positive way, and it would be appropriate to use the robots in the background tasks in different departments. Moreover, they also referred to the themes of anthropomorphism (16), emotions (15), social relations (14), and fun/pleasure (12). Employees, who thought robots look like humans physically, stated that robots would never replace humans in the service industry. They also emphasized the importance of Turkish hospitality as a mainstay. While some employees approached service robots positively, others considered them as completely repulsive. In addition, some of the employees thought service robots would have a positive effect on social relations, while others assumed that such a development of technology

would make people lonely and weaken relationships. Employing service robots at hotels was considered as enjoyable for some of the employees, but it could become unpleasant as the number of robots increased. As a matter of fact, the results of the analysis revealed different perspectives on the use of service robots. The participant views on service robots are presented below.

> I think service robots will affect performance and service quality. However, I don't think they can work in all positions at hotels. But the importance attributed to technology will attract the attention of the guests. It will arouse interest. Indeed, since the hotel uses technology, it will create a quality perception of the guests. (P8)

> I think the majority of people will enjoy service robots because most people are interested in new technologies. I think these curious people will be pleased with the robots. However, it will not replace of humans because guests in a hotel will want a warm welcome, so emotions should have a priority. (P11)

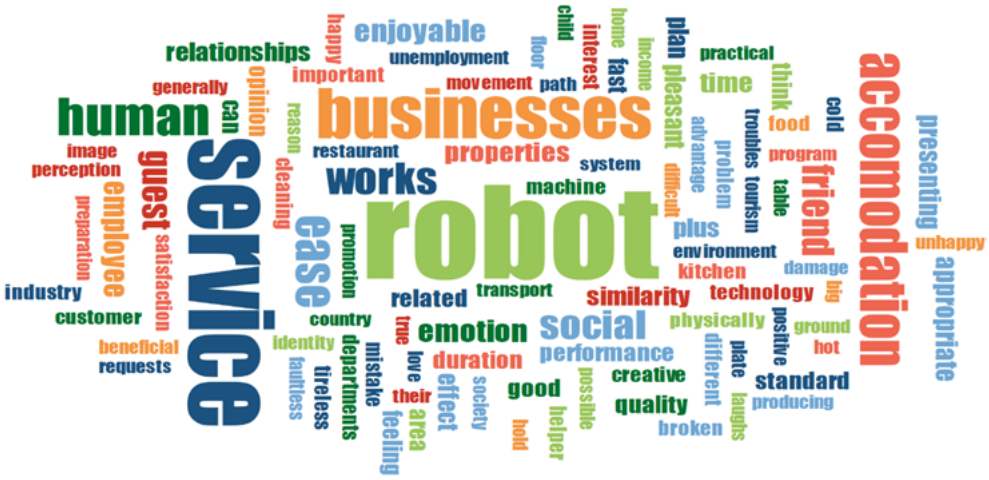
> Service robots can physically look like humans. However, it cannot replace humans. It would be good for jobs to progress quickly, but guests sometimes tell us their problems. How are they going to apply this to robots? We are people the guests have never met, and perhaps will never see again in their lives. That's why they can tell us about their personal things. We listen to them because hotels are social environments. (P5)

> In the beginning, service robots will contribute in terms of social energy and mobility. They will create a different atmosphere. When the use of robots increases, every tourist will definitely want to accommodate in a business that works with robots. But gradually this situation will decrease. It is like fashion; they will expire when they are consumed. They may not be liked among the employees, or they may be considered as machines that work just like food processors or coffee machines. For the guests, I think they would not be considered as a warm welcome. (P12)

> I don't think they will provide convenience. If the guest comes and asks something from the reception, will he press the button? It's weird, I wouldn't consider it as providing a service. In the tourism industry, we need to make the guests feel that they are getting service. How are we going to make it feel this way? They may be useful in background jobs that require speed. For instance, they can work as bellboys. In that case, employees will lose the jobs that they earn a great deal of money. (P6)

> I am certainly pleased with the use of service robots. We should comply with the technology. It is very important for the business image. The fact that only robots are working in hotels may affect the guests positively. But I still think it would be more satisfying to have the robots running in the background. (P3)

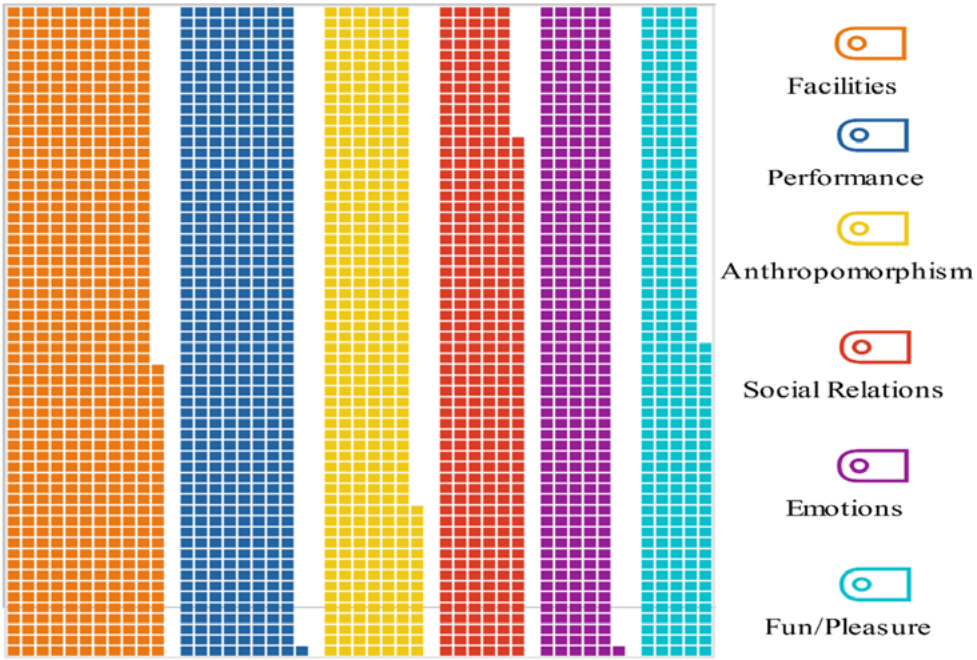
Figure 3. Word cloud for service robots



In total, 3986 words were identified using the word frequency analysis which was carried out to detect the keywords about the opinions of the hotel employees towards service robots. Some words originating from the structure of the language were combined, and some words were excluded. Regarding the analysis results, 981-word frequencies were identified. In Figure 3, 100-word groups were introduced. The size of the words in the word cloud was directly proportionate to their frequency. Robot (227), service (182), enterprises (107), accommodation (82), and human (71) were among the words with the highest frequency. These words were repeated frequently as the research aimed to reveal the perspectives of employees in accommodation enterprises about service robots.

Figure 4 showed the portrait of the document presenting the area where the themes were coded in the document. The high number of colored tiles was directly proportionate to the length of the relevant theme. During the interview, the employees mentioned about the conveniences that service robots would provide. The shortest mentioned theme was the fun or enjoyable aspects of service robots.

Figure 4. Document portrait for service robots



5. Conclusion and implications

The rapid development of technology has led to industrial revolutions, and thanks to Industry 4.0, smart applications have started to gain importance in every district in life. Although it is labor-intensive, the tourism industry has adapted to the technological developments and smart applications have begun to be benefited in the sub-branches of the industry (Atsız, 2021; Karakuş & Onat, 2021). It is known that artificial intelligence, which is an important smart application, especially in the accommodation industry, and robot technology have become widespread (Fırat & Fırat, 2017; Lashley, 2008). Although the entire tourism industry is not suitable for robotization, the number of robot employees is increasing as an alternative to human employees. It is considered that using service robots in tourism will have different effects on tourism workers (Vatan & Doğan, 2021). Therefore, this research measured the willingness of employees of a five-star hotel in Nevşehir to work with service robots using a quantitative method. At the same time, considering the results of the interviews with employees and managers, it revealed the perspectives of employees on service robotics with a qualitative method. The results of this research, which was carried out with the mixed method, were discussed in terms of theoretical and practical contributions and the discussion part was included.

5.1 Theoretical implications

This research is a significant contribution to the literature as there were not any studies that deal with the willingness of service robots of five-star hotels in Turkey through the mixed-method. Quantitative findings suggested that employees of five-star hotels in

Nevşehir were relatively willing to work with service robots. Hotel employees emphasized that service robots would contribute socially, in other words, the enterprises would gain prestige in the social environment. They also stated that service robots would provide more accurate and reliable service than humans, that it would be pleasant and easy to work with, and they would feel happier. However, they also said that they could never take the place of humans as they did not have a mind, consciousness, free will, or emotion. These results were consistent with the study of Ivanov and Webster (2019) and Ivanov, Webster, & Seyyedi (2018).

Another important contribution is that the research put forward that the willingness of the employees to work with the service robot differs in terms of demographic variables. In this respect, while employees considered the issue of working with service robots in terms of the convenience they would provide, managers evaluated the emotions they would feel in general. Similarly, high school and associate degree graduates focused on the facilitating conditions of working with service robots, while hotel employees with a bachelor's degree focused more on the positive emotions that would emerge. In addition, more experienced employees stated that the performance of service robots would be higher in general, working with robots would be enjoyable and fun, they would have positive social effects on the immediate environment, and they would have positive feelings towards robots. Finally, the characteristics of the departments revealed different levels of willingness to work with service robots.

The qualitative findings that had similar results with the quantitative findings can also be considered as a contribution of the research. Hotel employees were more interested in the performance and convenience of service robots. Some employees stated that service robots would be fast and practical and that it would be appropriate to work in the background in many departments. In addition, some employees stated that service robots would show human-like features physically, but they could not replace humans due to the labor-intensive feature of tourism. Similar to the results of the studies of İbiş (2019) and Vatan and Doğan (2021), while some of the employees had positive feelings towards service robots, others stated that they found them repulsive because they were concerned about the unemployment that service robots might cause. Besides, some of the employees stated that they would gain prestige thanks to service robots and that it would be very enjoyable to work with service robots. Finally, it was suggested that the employees mostly focused on the conveniences provided by the service robots.

5.2 Practical implications

The use of service robots in some areas at hotels will make significant contributions in order to achieve a certain service standard. Accordingly, it will play an important role in minimizing service failure and increasing service quality. On the other hand, service robots will ease the workload of the employees and will help to provide a more effective and productive working environment. In addition, with the ease in the workload, employees will have more time and will be able to use this valuable time to provide better service. However, employees emphasize that service robots should be used mostly in background services and at tasks that staff had difficulties. Some employees were concerned that service

robots would increase unemployment. Although service robots provided some convenience in terms of workload in this regard, it was unlikely to replace humans completely at hotels.

5.3 Limitations and future research

The research was limited to the employees of five-star hotels without service robots in Nevşehir. Another limitation of the study was the gathering of questionnaires and interviews in a certain period. In this context, it would be beneficial to carry out further studies on service robots in different destinations or in the population of other tourism stakeholders. Moreover, examining the service quality offered by service robots in terms of customer satisfaction can provide valuable results. Investigating the cost-of-service robots to hotels and their advantages and disadvantages are important issues. Finally, the psycho-social effects of service robots on customers and employees are other important issues.

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