PERCEPTIONS ABOUT IMPLEMENTATION OF SERVICE ROBOTS IN HOSPITALITY BUSINESSES IN KAZAKHSTAN AND RUSSIA - COMPARATIVE ANALYSIS

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Abstract: Our goal is to assess the understanding and acceptance of robotization in hospitality, based on research done in the two countries. This research applies a survey method to collect respondents' opinion of hospitality employees vs hospitality customers. The main sampling frames are formed by employees of hotels, restaurants and other hospitality businesses. Five hypotheses are studied and tested for the two categories of respondents in each country. The results from the statistical analysis differ for the studied countries, and between the two studied categories of respondents. The study confirms the expectations of improving the quality and increasing the effectiveness of robotizing the hospitality businesses. This research adds knowledge and understanding of how the hospitality employees and customers in Kazakhstan and Russia consider the implementation of service robots. The statistics show that the findings have value and can be used by hospitality managers when they consider possible robotization.

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INTRODUCTION

The difference between the consumers' perception in Kazakhstan and Russia about robotization has not been studied much, with a few exceptions (e.g., Ivanov, Webster and Garenko, 2018), although the robotization and AI implementation in general needs to be analyzed because of the different effects and consequences of that process.

The objectives of this study are to analyze on comparative basis the two countries – Kazakhstan and Russia, with the aim to find answers to questions that are important for the management of the hospitality businesses, including:

1. The respondents' (consumers' and hospitality businesses employees') perception about being served by service robots in the hospitality businesses, especially in the hotels and restaurants.
2. The respondents' anxiety of losing their jobs in case of intensive robotization.
3. The changes in business efficiency as perceived by the respondents.
4. The respondents' perception about the quality of services after possible robotization.

It is important to acknowledge that the development and use of human-like robots – both humanoid (resembling humans) and android (machines with human-like movement and speech) – may initially have a mixed impact. While these innovations could positively influence customer perceptions over time, they may also provoke some negative reactions, especially at the early stages of adoption. e.g., Uncanny valley effect (So et al., 2023) as well. This raises questions about the limitations of any research on this topic, including this study.

The contribution of this study of Kazakhstan and Russia is expected to be in answering the following questions: 'Do users/customers of hospitality services perceive implementation of service robots of different types as a positive idea?', 'Will there be improvement of business efficiency and quality of services?' Another important issue for research is whether the implementation of service robots create some level of anxiety among customers. Overall, this study makes the following contributions:

This comparative study aims to clarify the difference in service quality and efficiency, between the traditional human service staff and service robot from the perspective of respondents.

Second, this research aims to examine anxiety as a possible effect of robotization in case that the respondents expect changes in their employment status, as this is a risk factor in the process.

The discussion on that is expected to help managers decide to what extent to invest in robotization, which technically is an excellent substitute for human staff, but can lead to unwanted marketing and economic effects if customers do not approve of such changes.

THEORETICAL BACKGROUND

As already discussed above, the consumers' perception about being served by service robots in different businesses, including hospitality businesses, especially in the hotels and restaurants, has been studied in many publications, e.g., So et al., (2022). The spectrum of publications includes analysis of the active use of artificial intelligence (AI), including augmented reality, virtual reality (e.g., Grundner & Neuhofer, 2021; Verma et al., 2022) and robots used for repetitive, leading to stress and tiredness operations (e.g., Kim et al., 2023) studying hotels, including luggage and room services provided by robots in hotels, and the food and beverage industry (Mende et al., 2019). The results of this research contribute to improving service quality and the service experience.

In 2023 and 2024 only, dozens of excellent research-based papers were published, e.g., Liu et al, 2024; Pitardi et al, 2024; Rasul et al, 2024; Soliman et al, 2024; Tekeli, Kemer & Tekeli, 2024; Wirtz et al, 2024. Most of them analyze developments and trends in accordance with the ideas for mass replacement of the human factor with robots and robotized systems.

So, these papers study the robotization in the hospitality industry, analyzing it from different angles, from improving the quality of services (e.g., Mingotto et al., 2020; Jabeen et al., 2022; Yang and Zhang, 2022), to consumer behaviour toward service robots (e.g., Soliman et al., 2024), the impacts of robot anthropomorphism on consumers' trust, receptivity and satisfaction (e.g., So et al., 2023), and even the possibilities for offering ChatGPT services (AI based) in cultural tourism (Sigala et al., 2024). Addressing the new demand of some of the younger customers to receive modern service, and related customer engagement has been studied as well (e.g., Rasul et al., 2024). Another topic is analyzing the difference between the customers' views on older automated self-service technologies versus service robots (Wirtz et al., 2024). Tekeli et al. (2024) analyze the differences in the employees' attitude to robotization in relation to their education, position and the department where they work. These are all important

viewpoints on customers' perception of service robots, as the economic and therefore financial results of robotization are achieved based on the consumer liking or disliking of the new services they get. In many of the recent publications robotization is analyzed from demand-side perspective (e.g. Pizam et al., 2024; Soliman et al., 2024; Moriuchi and Murdy, 2024). Song et al. (2024), Pitardi et al., (2024), and Saputra et al. (2024) go further analyzing the customers' intention to continue to use the services of hotels based on their feelings about the anthropomorphism and perceived intelligence they see, or feel being served by robots. It is clear that some customers will feel anxiety and discomfort when they are served by robots or AI systems, which they define for themselves as robots (e.g., Soliman et al., 2024; Wang et al., 2023). The effect of services done by robots on customers' emotional and behavioral responses (e.g., Bagozzi et al., 2022; Kim et al., 2023), and the metaperception effect on the customer response (Pitardi et al., 2024) have been analyzed in research-based papers. This research extends previous work by exploring the broader influence of general technology perceptions on attitudes towards service robots.

Based on their different education, experience and cultural characteristics the customers understand and interpret the service robots in a different way. The robots, in particular service robots, no matter how defined, e.g., as intelligent physical devices or intelligent physical devices with a certain degree of autonomy, or anthropomorphism-based AI robots (Saputra et al., 2024), are often interpreted by the customers in a relatively simple way.

Previous research indicates that hospitality clients generally accept service robots, hold positive views about them, accept using them and are willing to pay for services from businesses employing robots (e.g., Wang et al., 2022). Tourists perceive robots as innovative and appealing devices which add to service quality (Belanche et al., 2020).

Research has also highlighted the influence of anxiety caused by service by robots and the specific emotions (e.g., Wang et al., 2023) on consumer attitudes and behaviour towards service robots. Although the role of robotic service expectations in determining readiness to pay for robot services has been studied, less research is done on how anxiety and negative emotions influence customer intentions, especially the cognitive and emotional responses.

The researchers have also emphasized the need for further investigation into how robots affect service quality and customer satisfaction, which is related to customer perceptions of added value. Rasul et al. (2024),

based on 73 independent studies with a total sample size of 41,757 respondents, underline that customer/tourist experience (CE) has a positive impact on both tourist satisfaction and hedonic value, but it is not clear to what extent, if at all, the service robots lead to tourist satisfaction, and if they add hedonic value, which refers to the emotional state of an individual who experiences pleasure or excitement from the product. Schepers et al. (2022) emphasize that robots have the potential to increase customer satisfaction across various types of services, from low-cost options that rely on mechanical robots to full-service providers. However, this remains a hypothesis for now. Several studies have explored robotization in the two countries (e.g., Gasumova & Porter, 2019; Starovatova, 2023; Shustova, Blagoev & Zhuk, 2024), focusing on the shift from managing human workers to managing organizations using robots. Ivanov, Webster & Garenko (2018) have examined customer perceptions of robots in Russian restaurants and hotels. The authors have found that while preferences for human employees over robots in hotels are relatively high (Mean 4.18 out of 5), it has been found that robotized service is still viewed as an interesting experience (Mean 4.04). The research has also explored how respondent gender and general attitudes towards new technologies influence these preferences. The main tasks where service robots were favoured included luggage handling (Mean 4.32), fulfilling customer requests for items like towels (Mean 4.22), and processing payments (Mean 4.12 for card payments, 4.02 for cash). Robots were also appreciated for providing information about hotel services (Mean 4.06) and local destinations (Mean 3.98).

In terms of service quality, there is a distinction between machine-type robots that perform specific tasks without resembling humans and human-looking (anthropomorphic) robots, specially designed to look and behave more like humans. Such humanoid robots can meaningfully interact with customers, which improves the quality of service. Mende et al. (2019) and others argue that anthropomorphism is a preferred trait in service robots, as it facilitates easier customer interaction, improving their perception of service quality. For instance, Sheehan et al. (2020) have found that anthropomorphism boosts fondness for both the brand and product. However, other researchers warn that robots which look too human-like could provoke negative reactions from customers who sees them as a threat to human identity (Mende et al., 2019). Over time, as humanoid robots become more prevalent, it is expected that people will become accustomed to them and may even prefer such designs. The "uncanny valley" theory (So et al., 2023) suggests that there may be a U-shaped relationship between customer

comfort and robots which imitate humans (e.g., Crolic et al., 2022). So et al. (2023), for example, have examined the impact of robot anthropomorphism on consumer satisfaction and while Huang et al. (2021) have argued that customers typically respond positively to more human-like robots, experiencing little discomfort during interactions.

Metaperception

Our respondents in Kazakhstan and Russia have limited personal experience with anthropomorphic service robots in hospitality, but they have good experience with AI services. Therefore, we must analyze the meta perception as a possible drive in forming their perceptions. We have tried to analyze the impact of robots on customers' behaviour and emotional responses (e.g., Bagozzi et al., 2022; Pitardi et al., 2024). In our case, the possible feelings of discomfort (e.g., Liu et al., 2023) are of interest, as our research shows a difficult-to-explain combination of respondents' liking of robotization with their anxiety about losing their jobs as a result of robotization. Metaperception is the process and effect on people evaluating the impressions that others may form about them and their behaviour. Pitardi et all. (2024) claim that when customers experience discomfort, their perception that service robots cannot think or form opinions will form a perception (i.e., metaperceptions) of robots only as service assistants and thus reduce the discomfort experienced, compared to that in case of being served by human beings. Becker et al. (2023) have found that "human-like robots can increase comfort, leading to more positive service outcomes", but this will probably be different for customers who find those robots too human, and because of that "dangerous". If there is a positive metaperception, this will obviously lead to higher intentions of re-use and re-visit.

In conclusion, based on the substantial previous research and the discussions above, it is clear that hospitality clients generally accept service robots, maintain positive views of them and value positively being served by robots and robotized systems. Robots have the potential to increase customer satisfaction across a variety of services, from low-cost options that rely on mechanical robots to full-service providers.

METHODOLOGY

This research adopts a demand-side perspective, e.g. in Moriuchi and Murdy (2024), as well as in Song et al. (2024) and Pizam et al. (2024). The focus on tourists' perceptions is based on the opinion of customers about being served by robots.

With all this in mind, we have decided to analyze the following hypotheses, comparing the findings in the two countries:

H1: The respondents believe that the hospitality customers prefer being served by robots instead of human employees.

H2: The respondents support the intensive implementation of service robots in the hotels and restaurants, as well as in other hospitality businesses.

H3: The respondents are not afraid of losing their jobs after robotization.

H4: The respondents believe that the effectiveness of hospitality businesses will increase based on implementation of service robots.

H5: The respondents believe that the service robots will increase the quality of provided hospitality services.

Research design

Data collection took place between March 2023 and April 2024, using a survey administered via email to respondents within the research population from the two countries under study – Russia and Kazakhstan. A non-probability sampling method was employed. The research population comprised individuals over 18 years old residing in Kazakhstan and Russia. The two samples included 251 respondents in Russia, and 337 in Kazakhstan.

Data collection and analysis

The questionnaire was designed in Google Form. It consists of three main sections – demographics, questions related to the studied hypotheses, and others, e.g. 'Does the company of the respondent use AI and service robots?'. The questionnaire was emailed to the managers, as well as to contact emails of the hotels, restaurants and other hospitality businesses, as well as to alumni, colleagues and friends who were active users of hospitality services. Google Forms was used for collecting the primary data from the respondents.

Different statistics were used to analyze the findings, including Descriptive statistics and Correlation analysis.

Limitations, Reliability, and Validity of the results

The reliability and validity of this study has been limited by the small number of cities (districts) of respondents surveyed – Semey, Astana and Pavlodar in Kazakhstan, and St. Petersburg in Russia. It is clear that these numbers cannot represent correctly enough the opinion of the population in

the two countries. In addition, the number of employees in hospitality businesses in the two countries is small (136 in Kazakhstan, and 78 in Russia, and although the statistical results should be taken as indicative, they cannot be considered fully representative for that population. Still, the findings give interesting results, which can be used by managers in case they consider robotization in the hospitality businesses they manage.

Ethics

The questionnaire begins with a consent section that explains the purposes of the survey and the way the responses will be processed. Adding to this the use of Google Forms to process the responses ensures that no ethical rules and principles have been violated, and the findings of this study should be considered as valid.

FINDINGS

The statistical analysis of the survey results is made with the aim to analyze the stated hypotheses.

Hypothesis 1

The first hypothesis is that the respondents believe that **the hospitality customers prefer being served by robots instead of human employees**. The findings of this study show the following results (Table 1):

Table 1.
Respondents working in the hospitality businesses believe that customers prefer to be served by people

CUSTOMERS PREFER HUMAN SERVICE (% employees in hospitality businesses)	KAZAKHSTAN	RUSSIA
	71.3	**84.3**
Mean	2.14	2.53
Standard Error	0.10	0.08
Median	2	3
Mode	3	3
Standard Deviation	0.84	0.65

As Table 1 shows, the vast majority of hospitality employees believe that their customers prefer to be served by humans rather than by service robots. The results comparing the views of hotel employees with other respondents (Table 2) are similar for Russia and different for Kazakhstan. Over 77% of other respondents in Kazakhstani believe that the customers prefer to be served by humans versus 71.3% of hospitality employees.

Overall, the vast majority of the respondents believe that customers prefer to be served by humans rather than service robots.

Table 2.
Respondents' perspective on hospitality customers' perception of being served by people

KAZAKHSTAN Hospitality employees vs Other respondents			RUSSIA Hospitality employees vs Other respondents		
HUMAN services preferred	**Hospitality employees**	**OTHER respondents**	**HUMAN services preferred**	**Hospitality employees**	**OTHER respondents**
	71.3	**77.5**		**84.3**	**82.4**
Mean	2.14	2.33	Mean	2.53	2.47
Standard Error	0.10	0.06	Standard Error	0.08	0.10

Thus, H1 is rejected. The respondents believe that the customers in the hospitality businesses do not expect and do not prefer to be served by service robots.

Hypothesis 2

The second hypothesis H2 is that **the respondents support the intensive implementation of service robots in hotels and restaurants**, as well as in other hospitality businesses. Obviously, this hypothesis should be expected to be rejected according to the findings on H1. However, the survey shows different results (Table 3):

Table 3.
Respondents' view on implementing service robots in the hospitality businesses

KAZAKHSTAN Implement service robots Hospitality employees vs Other respondents			RUSSIA Implement service robots Hospitality employees vs Other respondents		
SERVICE ROBOTS to be implemented	**Hospitality employees**	**OTHER respondents**	**SERVICE ROBOTS to be implemented**	**Hospitality employees**	**OTHER respondents**
	62	**59.7**		**60.7**	**64.4**
Mean	1.86	1.79	Mean	1.82	1.93
Standard Error	0.10	0.06	Standard Error	0.10	0.10

The findings of this survey confirm H2, although they totally neglect the findings on H1. The same respondents, who believe that the customers prefer to be served by humans, strongly support the implementation of service robots. The statistics for hospitality employees and other respondents are similar, and in Kazakhstan the hospitality employees support the robotization even more than the other respondents. For the two studied samples (countries) the results do not differ much.

Hypothesis 3

Hypothesis 3 states that **the respondents are not afraid of losing their jobs** as result of robotization.

Table 4.
Respondents' view on the possibility of losing their jobs (in hospitality businesses) as a result of implementing service robots

KAZAKHSTAN Possible losing their jobs after robotization Hospitality employees vs Other respondents			RUSSIA Possible losing their jobs after robotization Hospitality employees vs Other respondents		
Lose their jobs after robotization	Hospitality employees	OTHER respondents	Lose their jobs after robotization	Hospitality employees	OTHER respondents
% agree	45.8	57.2	**% agree**	60.6	50.9
Mean	1.38	1.72	Mean	1.82	1.53
Standard Error	0.08	0.06	Standard Error	0.07	0.10

The findings in Table 4 are different for the two countries. The hospitality employees in Russia are much more afraid of losing their jobs after robotization compared to their colleagues in Kazakhstan (60.6% vs 45.8%), while the findings from the other respondents are different in the other direction (50.9% in Russia vs 57.2% in Kazakhstan). There is no clear explanation for these differences, except for possible differences in the management of hospitality businesses in the two countries. It is possible that in Russia the employees in hospitality businesses are more likely to openly discuss the possible consequences of robotization, while in Kazakhstan they assume that it is an expensive process and customers will exert pressure in favour of human service. Overall, the findings reject Hypothesis 3, as the majority of respondents are afraid of losing their jobs as a result of robotization.

Hypothesis 4

Hypothesis 4 states that **the effectiveness of hospitality businesses will increase** based on implementation of service robots.

The findings of this survey show the following results (Table 5):

Table 5.
Respondents' view on the effectiveness of hospitality businesses as a result of implementing service robots

KAZAKHSTAN Change of the effectiveness Hospitality employees vs Other respondents			RUSSIA Change of the effectiveness Hospitality employees vs Other respondents		
EFFECTIVENESS Increased	**Hospitality employees**	**OTHER respondents**	**EFFECTIVENESS Increased**	**Hospitality employees**	**OTHER respondents**
% agree	*65.7*	*68*	**% agree**	71.3	73.1
Mean	1.97	2.04	Mean	2.14	2.19
Standard Error	0.11	0.06	Standard Error	0.07	0.11

Table 6 shows similar results on the respondents' perception of possible increase in effectiveness. The Russian respondents expect higher results, but the difference with the Kazakhstani respondents is not significant. Altogether, H4 is confirmed.

Hypothesis 5

Hypothesis 5 states that the service robots will increase the quality of provided hospitality services.

Table 6.
Respondents' view on the change of quality as a result of implementing service robots

KAZAKHSTAN Change of the quality Hospitality employees vs Other respondents			RUSSIA Change of the quality Hospitality employees vs Other respondents		
QUALITY Increased	**Hospitality employees**	**OTHER respondents**	**QUALITY Increased**	**Hospitality employees**	**OTHER respondents**
% agree	*62*	*6.,7*	**% agree**	70.8	73.6
Mean	1.86	1.85	Mean	2.13	2.21
Standard Error	0.10	0.06	Standard Error	0.10	0.10

The findings of this study (Table 6) show that generally the respondents support this view, with respondents in Russia showing significantly higher expectations (70.8% in Russia vs 62% in Kazakhstan for the hospitality employees, and 73.6% vs 61.7% for the other respondents). There is no

clear explanation what causes this difference. It is possible that the current experience of the respondents with AI-related services shows an increase in service times compared to previous human services, which the respondents interpret as decreased quality of service. Overall, Hypothesis 5 is confirmed. However, we must take into account the fact that about 30% of the respondents in Russia and about 40% of the respondents in Kazakhstan do not expect an increase in the quality of services in the hospitality industry after the implementation of service robots.

The results of H4 and H5 show that the Russian respondents are more positive about the implementation and use of AI and robots in services in the hospitality businesses.

DISCUSSION

The findings can be illustrated as shown in Fig.1 and Fig. 2. The most interesting element is the differences between the perceptions of hospitality employees and other respondents in the samples in Kazakhstan and Russia. Tables 4, 5 and 6 show a difference in the opinions of these respondents. As discussed above, this may be a result of different management in the two countries, as well as different perceptions of the respondents about the possible influence of the customers who may prefer human service. Finally, we have to take into account the differences between the national cultures.

Fig.1: RUSSIA vs KAZAKHSTAN
Employees in hospitality businesses

Fig.2: RUSSIA vs KAZAKHSTAN
Respondents from OTHER businesses
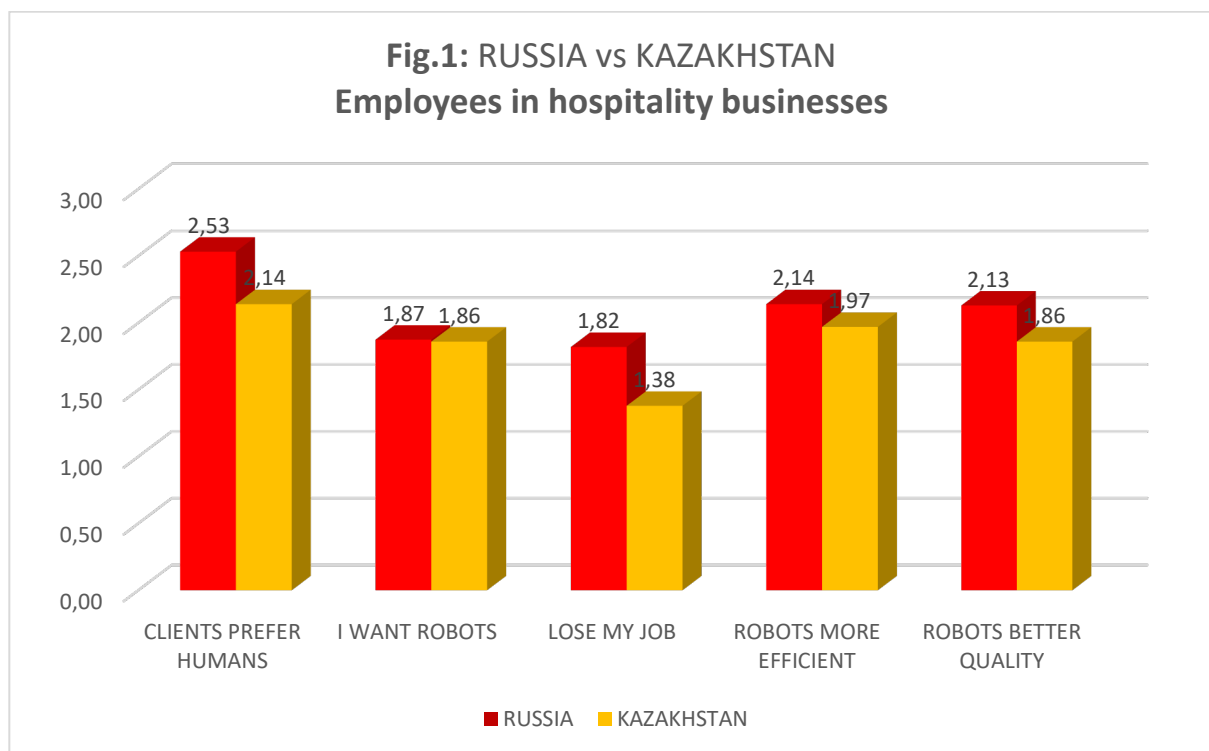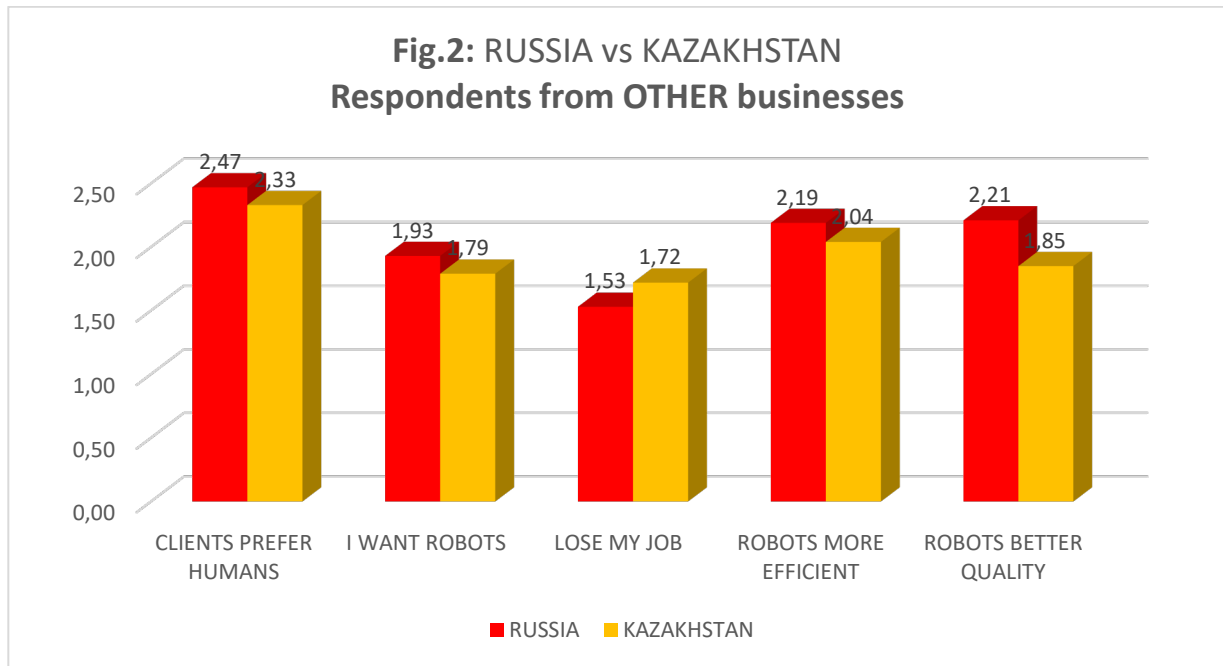
The most interesting and significant correlations are between the support for implementation of service robots in the hospitality businesses and the concern about possible job losses. The employees in hospitality in Russia have higher expectations of losing their jobs as result of robotization (Fig.1, mean 1.82 vs 1.38, stand. dev. 0.89 vs 0.70) compared to Kazakhstani respondents.

Conclusions

The research findings can be summarized in the following conclusions:

1. The service robots and AI technologies in general, have entered all areas of business activities, including the hospitality businesses in the two countries studied. This research shows that 42% of the respondents in Kazakhstan report using AI and robots in their companies, while in Russia about 28% claim the same. Obviously, this difference has influenced the responses. It can be said that the respondents in Kazakhstan have a better knowledge about the positive and negative aspects of using robots compared to the respondents in Russia.

2. The first hypothesis - the respondents believe that hospitality customers prefer being served by robots instead of human employees - was rejected (Table 2). The survey shows the opposite results. The respondents believe that the customers in the hospitality businesses do not expect and do not prefer to be served by service robots.

3. The second hypothesis is confirmed - the respondents support the intensive implementation of service robots in hotels and restaurants, as well as in other hospitality businesses (Table 3).

4. Hypothesis 3 states that the respondents are not afraid of losing their jobs as a result of robotization. The results of the survey reject this hypothesis (Table 4). Interestingly, the findings for the employees show 45.8% in Kazakhstan vs 60.6% for Russia, while the results for the clients' perception are opposite: 57.2% in Kazakhstan vs 50.9% in Russia.

5. Hypothesis 4 - the effectiveness of hospitality businesses will increase based on implementation of service robots - is confirmed (Table 5).

6. Hypothesis 5 - the service robots will increase the quality of provided hospitality services, is also confirmed (Table 6).

7. The results on H4 and H5 show that the Russian respondents are more positive about the implementation and use of AI and robots in services in the hospitality businesses.

Based on the results of this research we can say that the use of service robots and AI, in general, will increase the efficiency of companies operating in various sectors of the economy. It is expected that labour costs will be reduced, work processes will be intensified, in service enterprises the quality of services for the population will improve, and in industrial enterprises the quality of products will also improve. Further research on the topic, especially adding other countries, and analyzing the responses of larger samples will add important information to help make appropriate decisions when implementing AI and robots.

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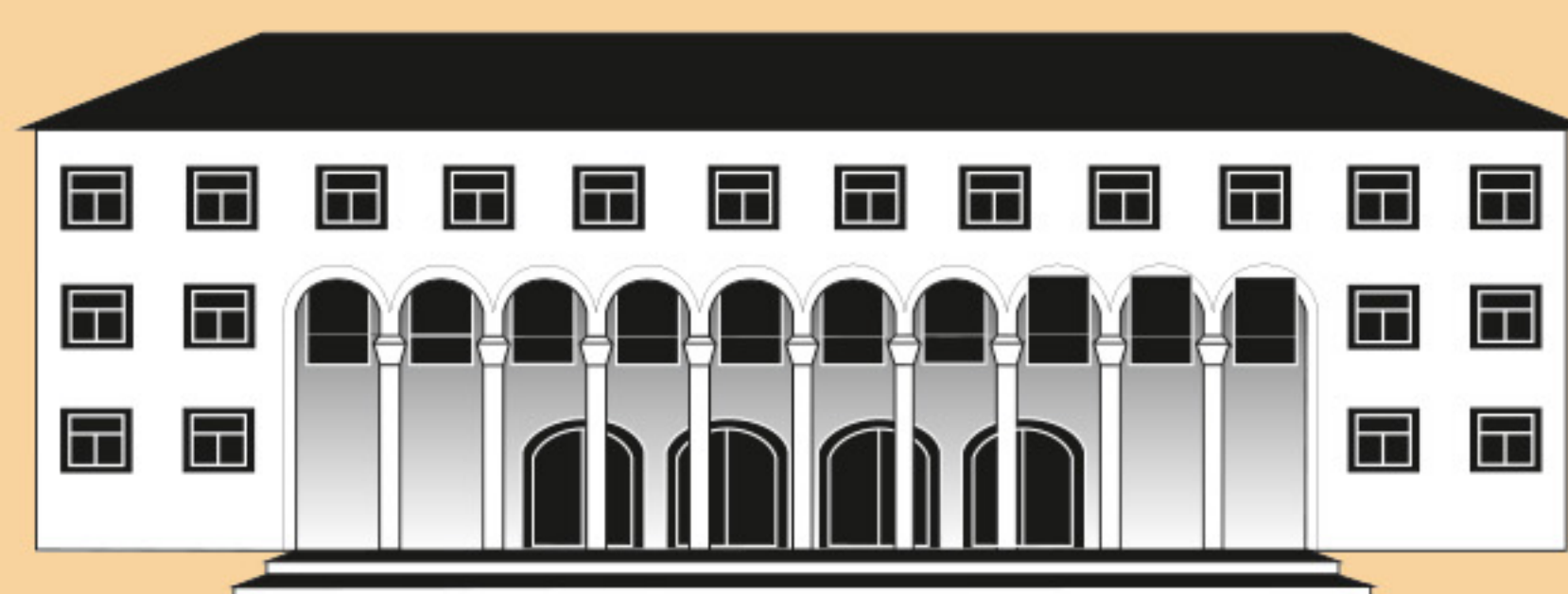
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