



THE MAIN CONCERNS OF EMPLOYED PEOPLE REGARDING ROBOTS AT WORKPLACE IN THE DIGITAL AGE

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Abstract:

Robots are gradually becoming a part of workplace. A large number of businesses continuously introduce robots or robotic manufacturing systems. Employees are once again confronted with new technological achievements at work. The purpose of this paper is to highlight the main concerns of employees regarding the use of robots in the workplace. The empirical study, which took place in the period from October 2022 to January 2023, encompassed 94 participants. The findings revealed that the most common concerns were that robots do not possess capacity to react adequately in unexpected situations, that respondents would feel lonely if their co-workers were robots rather than people, and that robots lacked human flexibility and mobility. Findings obtained in this study can be used by decision makers and human resource managers with the aim to overcome the main concerns while implementing robots at workplace. It is highly likely that technological advancement will result in new type of robots which will have new features and characteristics that are increasingly human-like.

Keywords:

Employees, Digital Business, Digital Age, Robots, Agility.

INTRODUCTION

In the digital age, agility is a necessary precondition for the successful operation of any organization. Organizations face a lot of pressure to become agile in the time of turbulence, high dynamism, unexpected events, and unpredictable changes. Leaders must be able to respond quickly and effectively to all challenges and opportunities. Agility is the ability to respond and adapt to new situations while actively looking for opportunities and chances to position an organization for potential future situations. It refers to how quickly and effectively an organization and its employees spot opportunities and challenges in the environment and respond to them [1]. In the digital age, organizations must be able to change quickly. Furthermore, organizations should incorporate new formulas for success in a chaotic, unpredictable, and non-linear environment into their mindset. One of the most recent changes is the use of robots in the workplace. Robots are intelligent physical systems that are equipped with sensors, actuators, and a certain level of artificial intelligence.

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They are programmed by computer algorithms to perform various tasks instead of humans or alongside them [2], [3]. There is a special type of robots - collaborative robots, or co-bots, which are designed to work and interact closely with humans, and which possess human-like characteristics [4].

In the time of fifth industrial revolution, organizations are increasingly incorporating robots [5], [6]. Due to that, humans are confronted with a new trend: robots as co-workers. The purpose of this paper is to highlight the most common concerns of employees regarding robots at workplace in the digital age. The primary research question is to identify the primary concerns of employed people regarding workplace robots. The paper is organized as follows. After introduction with key theoretical concepts, the second title focuses on research methodology and general sample information. The third title represents research findings and their discussion. In conclusion are summarized key findings, limitations of the research, as well as the recommendations for future research.

2. METHODOLOGY OF RESEARCH AND GENERAL INFORMATION ABOUT SAMPLE

The following research question (RQ) is imposed in this paper: What are the main concerns of employees about workplace robots? A questionnaire technique was used to answer this question. The questionnaire contained five questions. Gender, respondent age, level of education, and work-related experience with robots were the first four demographic questions.

The fifth question was designed as a five-point Likert scale with five statements that respondents scored from 1 to 5 based on the extent they agreed with the statements. A score of 1 indicated that respondents strongly disagreed with the statement, while a score of 5 indicated that respondents strongly agreed with the statement. The questionnaire was tested on a sample of 30 people to determine its reliability and validity. Cronbach alpha coefficient for measurement scale was 0.79, indicating high reliability.

Between October 2022 and January 2023, the questionnaire was distributed online via LinkedIn network in various professional groups which consisted of employed people from various industries. The questionnaire was completed by 94 respondents. Conclusions based on the results of this research cannot be generalized, due to small sample size. The general information about respondents is presented in Table 1. In terms of gender, 72% of respondents are female, while 28% are male. Almost half of the respondents (49%) are under the age of 25, while 29% are between the ages of 25 and 35. There are also 22% of respondents between the ages of 36 and 50. The majority of respondents (85%) have completed bachelor or master's degrees, while 11% have completed high school and only 4% have completed doctoral studies. Research results showed that respondents do not have any prior workplace experience with robots. This result was unexpected, but it is not surprising given Serbia's technological development. Respondents had no experience working with robots. As a result, their responses are based on their perceptions and beliefs.

Table 1 - General information about respondents.

	Number	Percentage
Gender		
Male	32	25.40
Female	21	16.67
Age of respondents		
Less than 25	46	48.94
Between 25 and 35	27	28.72
Between 36 and 50	21	22.34
Level of education		
High school	10	10.64
Bachelor/master studies	80	85.11
Doctoral studies	4	4.25
Work-related experience with robots		
Yes	0	0
No	94	100%



3. RESEARCH RESULTS AND DISCUSSION

According to the findings presented in Figure 1, the majority of respondents (59%) agree that robots lack human flexibility and mobility. Almost 30% of respondents are neutral on the statement, while 13% disagree. Respondents perceive robots as mechanical structures with limited spatial movement and coordination capabilities. This concern is justified, especially given that some types of robots must move autonomously in space and to the desired location. Warehouse robots, for example, must be able to move around factory floors, whereas assembly robots must be able to be moved to a desired location [7].

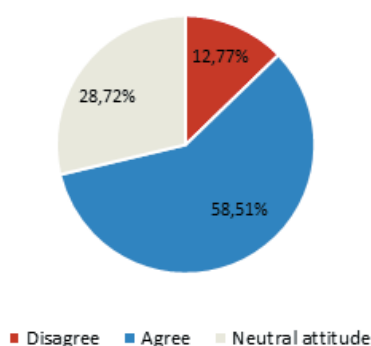


Figure 1. Robots lack human flexibility and mobility.

As it can be seen from Figure 2, more than two-thirds of respondents (67%) agree that robots may not know how to act in unexpected situations. More than one-fifth of respondents have a neutral attitude toward this statement, while 11% disagree. Respondents continue to believe that robots are programmed to act only in highly predictable and stable situations. It is highly likely that robots will be unable to respond appropriately in some unexpected situations. This statement is related to the previous one - robots are unable to perform some complex and challenging tasks that change frequently due to limited mobility and flexibility [8].

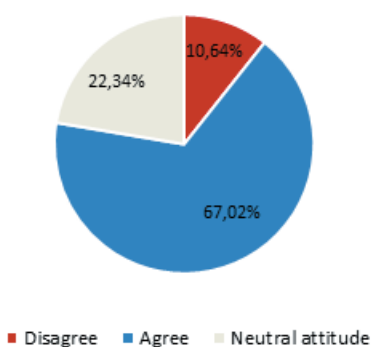


Figure 2 - Robots might not know how to act in some unexpected situations.

Several studies have found that people are concerned that robots will take their jobs and positions [9]. The findings of this study presented in Figure 3 revealed the inverse. Only 16% of respondents believe that robots will take over their jobs, while 19% are neutral. The majority of respondents (65%) disagree with the statement that robots could eventually replace them on the job. According to other studies, robots are frequent on many positions. They were primarily used in routine tasks and activities such as packing, picking, placing, welding, and gluing [10]. In the last couple of years, robots are becoming present in some creative and challenging positions such as travel agents, receptionists, customer service, and cashiers [11].

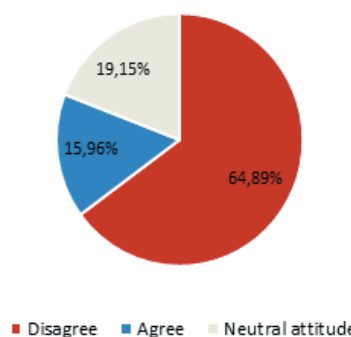


Figure 3 - Robots might take over my job.

Employees' feelings at work influence their behaviour and overall results. As it can be seen in Figure 4, nearly half of respondents (47%) disagree with the statement that they will have unpleasant feelings while working with a robot. There are an equal number of respondents (27%) who stated that working with a robot would be unpleasant for them and who are neutral regarding this statement.

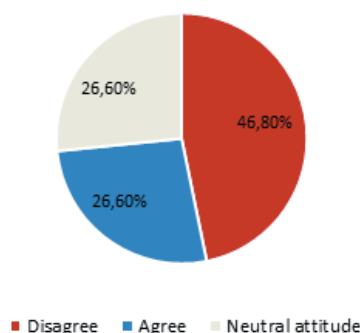


Figure 4 - Working with a robot would not be pleasant for me.



As it is shown in Figure 5, almost half of the respondents (48%) stated that they would not feel unsafe while working with a robot. On the other hand, there are also 28% of respondents who said they would feel unsafe while working with a robot, while 24% of respondents are neutral. Safety is a fundamental requirement in the design of a robot, particularly in workplaces where humans must collaborate with robots [12]. In that sense, safety implies that there is no possibility of robot accidents or risky behaviour [7].

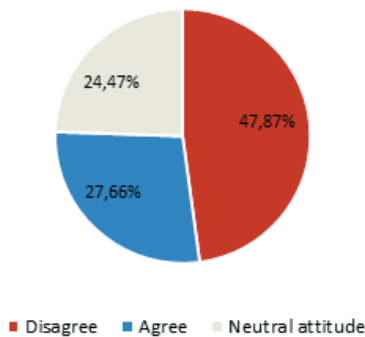


Figure 5 - Working with a robot would make me feel unsafe.

In Figure 6 are presented results regarding employees' feelings about robots as co-workers. More than two-thirds of respondents (68%) said they would feel lonely if their co-workers were robots rather than people. This is not surprising given that every employee desires co-workers with whom they can exchange new ideas, opportunities, and suggestions. Furthermore, 15% of respondents disagree with this statement, while 17% of respondents are neutral.

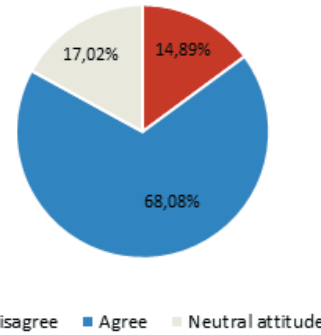


Figure 6 - If my co-workers were robots instead of people, I would feel lonely.

The mean values for each of the questionnaire statements are presented in Table 2 and Figure 7. The statement that robots might not know how to act in some unexpected situations has the highest mean value (3.95). The majority of respondents still envision robots in a stable, predictable environment performing routine, monotonous, and standardized tasks.

The statement that people would feel lonely if their co-workers were robots instead of people has the second highest mean value (3.85). The majority of the working day is spent at work. Employees have the need for colleagues to converse with them about various aspects of work. As a result, interpersonal relationships in the workplace are crucial. Work takes on greater significance and meaning when people collaborate, supporting and learning from one another [13].

According to the mean value, the third position is reserved for the statement that robots lack human flexibility and mobility (3.74). The majority of respondents still see robots as mechanical machines with limited moves and coordination efforts, rather than as flexible and mobile machines.

Table 2 - Mean values for statements.

Statements	Mean
Robots might not know how to act in some unexpected situations.	3.95
If my co-workers were robots instead of people, I would feel lonely.	3.85
Robots lack human flexibility and mobility.	3.74
Working with a robot would make me feel unsafe.	2.73
Working with a robot would not be pleasant for me.	2.72
Robots might take over my job.	2.17



Figure 7 - Mean values for statements.

4. CONCLUSION

Employees have concerns and difficulties each time they are faced with new technologies and methods of work. In this paper, empirical research was conducted with the aim of identifying employees' top concerns about the use of robots in the workplace. According to the findings of the survey, which included 94 respondents, the main concerns are that robots may not know how to act in unexpected situations, humans will feel lonely if they work with robots instead of people, and robots will lack flexibility and mobility.

Findings obtained in this study can be used by decision makers and human resource managers with the aim to overcome the main concerns while implementing robots at workplace. Managers and human resource managers can create a positive working environment by educating employees on workplace robots using a well-planned approach in the process of introducing technological solutions. Employees may not experience stress as a result of working with robots in this manner.

The number of respondents who participated in the research is one of the limitations of this study. The questionnaire received 94 responses. Furthermore, the questionnaire included closed questions and statements, without open questions in which respondents could express their own opinions and views. Besides that, the questionnaire did not include questions about respondents' occupation, industry, or geographic location so the conclusion cannot be generalized. It should also be noted that all respondents have no prior experience working with robots, so their responses are based solely on their beliefs and perceptions.

Future research on this topic should include a higher number of respondents, and in addition to questionnaires, in future studies should be organized interviews with the aim to obtain deeper knowledge and information about robots at workplace. Furthermore, it would be important to conduct research in those organizations who have already introduced robots at the workplace and to examine and analyse real concerns and problems. In order to gain a better understanding and to address this study's limitation, it would be beneficial to include in a questionnaire a broader set of questions about respondents – work experience, job position, industry, geographic location, field of education.



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