



# THE IMPACT OF JOB AUTOMATION ON MEN AND WOMEN IN THE DIGITAL AGE

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## Abstract:

Job insecurity represents the subjective perception that there is a possibility of losing one's current job, as well as fear and worry due to the possibility of losing one's job in the future. Many different factors influence the growth of job insecurity. One of them is the fact that most routine jobs and activities are becoming increasingly automated. The aim of this paper is to analyze the impact of job automation on men and women in the digital age. The results of the empirical research conducted in the period from December 2022 to January 2023, in which participated 126 women and 52 men showed that men were slightly more likely to believe that robots could replace them in the future. However, regardless of gender, the largest number of both men and women believe that robots will not take over their jobs.

## Keywords:

Digital Business, Digital Age, Automation, Job Insecurity, Robots.

## INTRODUCTION

Following the literature, since 2016, researchers were focused in large extent on topic of Industry 5.0. The European Commission officially declared the era of Industry 5.0 in 2021, indicating the transition to a more sustainable, humane, and resilient industry [1]. According to some authors, Industry 5.0 is a green and digital technological transformation aimed at creating a more sustainable and people-oriented industry [2]. There are also authors who argue that Industry 5.0 is significantly safer, more responsible, and more ethical comparing to Industry 4.0 [3]. Furthermore, Industry 5.0 is more focused on sustainability and a more humane approach, with the primary goal of producing personalized products and/or services through intensive collaboration between humans and robots [4].

In Industry 5.0, the primary purpose and goal of technology is to assist and facilitate people's work through a safe and inclusive work environment, physical and mental health, well-being, and respect for basic human rights, autonomy, dignity and privacy [1]. The contemporary work environment imposes an increasing need for robots and humans to work together, in harmony, according to their knowledge, skills and capabilities [5].

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By working together with humans and robots, it is possible to use all the advantages and potentials of human intelligence and intelligent work systems. Unlike Industry 4.0, whose primary goal was automation, Industry 5.0 strives for greater integration of humans and autonomous machines [6]. Autonomous machine is one in which decisions (in response to external inputs or signals of any complexity) are made within the system rather than by humans [7]. The most popular view is that autonomous machines - robots should interact with their environments without the need for ongoing human intervention [8]. One common question regarding automation is how it will affect men and women on their jobs. The aim of this paper is to analyze the impact of job automation on men and women in the digital age.

The paper is structured as follows. First, the position of women in the business world in the digital age is presented. The key characteristics and key jobs in which women are most often dominant are pointed out. Then the areas of automation in the age of Industry 5.0 and the results of studies examining the impact of automation on gender were emphasized. After that, the methodology of the conducted research is described and the results obtained from the research are presented with a discussion. In the conclusion are indicated key messages and suggestions for future research on this topic.

## 2. THE POSITION OF WOMEN IN THE BUSINESS WORLD IN THE DIGITAL AGE

The position of women has changed significantly throughout a history. In opposite to ancient Athens, where a woman did not have the right to vote, could not be appointed as a judge, or independently decide who to marry, where as a rule woman was illiterate and legally owned by her father or husband, the situation changed over time for the better. Today, women have the right to vote, they can be judges, they can independently decide who they will marry, they are usually literate and legally independent [9]. Furthermore, women have largely become part of the labor market, but they are still insufficiently occupying leadership and top management positions [10]. In addition, statistics show that women often work in lower paid jobs that are below their level of education and qualifications. One of the reasons is that women take on a significantly greater share of duties in family life, which contributes to them having less work experience and career breaks [11].

In the business world, women have been shown to have a higher degree of motivation, energy, enthusiasm, empathy, as well as highly developed communication skills, an expressed desire for all employees to be adequately and timely informed, and the need to provide each employee with constructive feedback. On the other hand, men have been shown to be better in the process of building knowledge based on past experience, in the process of innovating because they are open to new ideas and ready for changes, then better understanding the overall functioning of the organization, defining strategy, delegating tasks and responsibilities and persuasion other people in the quality of their ideas and proposals. Compared to men, women are better at assessing feelings in the work environment, which allows them to establish strong relationships with colleagues and to express their thoughts and ideas much more clearly [12].

Practice has shown that women are better in jobs where the emphasis is on interpersonal relations, knowledge sharing, assistance, organization and cooperation. These include education, healthcare, social protection institutions, state administration, human resources and similar. Many emphasize the importance of "flexibility at work" as a trait possessed by intelligent women who are full of self-confidence and which refer to the ability to quickly adapt to changes [13]. In the book "Why the best man for the job is a woman: the unique female qualities of leadership", based on the analysis of the careers of 14 women in management positions, it was indicated that women are capable of establishing new rules, of turning challenges into opportunities, and of communicating and spreading a set vision well [14].

The results of research carried out since 2015 by LeanIn.Org and McKinsey & Company entitled "Women in the Workplace" showed that the higher the hierarchical position, the less women are represented. However, over the years, there has been a slight increase in the number of women in managerial positions. The pandemic with the Covid-19 virus has also brought new conclusions related to women in leadership positions: namely, women leaders undertake additional efforts and efforts to support employees and assist them cope with work tasks in new conditions and circumstances [15]. Women have a higher degree of motivation, energy, enthusiasm, better communication skills, strive to keep all employees well informed, provide constructive feedback and set high goals. Men, however, are better at building knowledge based on experience, at innovating - they are open to new ideas and changes, at seeing the whole picture of the organization, defining strategy, delegating tasks and responsibilities, and convincing other people of the quality of their ideas and proposals.



### 3. THE IMPACT OF AUTOMATION ON WOMEN AND MEN IN THE AGE OF INDUSTRY 5.0

Automation of business processes and activities can be achieved by implementing various technologies. These can be different types and forms of robots, artificial intelligence systems, ATM devices, chat bots, algorithms and similar systems that do not require human participation in their work. The progress of modern information systems and technologies has enabled an ever-increasing scope for automation, not only of routine, but also of more complex and demanding business processes and activities.

Technological advancements have also contributed to a reduction in the burden of care work for large segments of the population. While technology has not achieved gender parity in the workplace, significant changes have occurred that have resulted in fewer hours worked in the household for many traditional caregivers. Consumer durables such as the washing machine, microwave oven, and personal computer have served as "liberation engines" for women in particular [16].

The way automation affects women and men vary due to different nature of work. Even when employed are engaged in the same job position, men and women perform different tasks and use different skills and knowledge [17]. Research conducted in Latin America showed that women have a higher average risk of automation due to the facts that men tend to be more engaged in information and communication technologies, science, engineering and mathematics tasks, while women perform highly routine activities such as tasks related to marketing and accounting [18]. The similar conclusion is obtained from the study of [19] whose results showed that 44.4% of employed women faced a moderate to high risk of automation compared with 34.8% of men. On the other hand, there are studies which indicate that men are on positions which require specialized technical skills, while women work on jobs that require more social skills that are difficult to automate [20]. For example, some authors point out that emotions and context cannot be automated [21]. Also, the way and content of communication, emotional intelligence, establishing good relationships and ethical principles belong to soft knowledge and skills that can't be automated [22]. On the other hand, it is important to point out that there are also authors who advocate the opposite point of view, namely that robots can perform certain tasks better than humans. Certain robots can communicate to the interlocutor exactly what is needed, in the right tone of voice, without the possibility of conflicts [22].

It is believed that men will be more exposed to the effect of automation because they are dominantly represented in more physically demanding jobs that are mostly repetitive and routine in nature and can be easily automated. These include: pallet transfer, packaging, dosing, palletizing, and so on. Additionally, modern technologies have made strong entrance into all spheres and enable the automation of some more complex and non-routine business processes and activities which are typical at higher hierarchical levels and managerial positions dominated by men. The automation process has a slightly weaker impact on women because they are traditionally dominantly represented in professions where social skills and emotional intelligence are expressed, which explains why it is much more difficult or almost impossible to automate these activities.

It is crucial to understand that everyone is unique and works in a unique context or situation. As a result, it is impossible to draw broad conclusions about the impact of automation on men and women that are universally applicable. Automation may increase efficiency, productivity, quality, and safety on the one hand, but it may also have negative consequences such as job displacement, technological-caused stress, and widening economic inequality on the other.

### 4. RESEARCH METHODOLOGY AND DESCRIPTION OF THE SAMPLE

In order to take insight into the extent to which men and women fear job loss due to automation, in this paper a survey was conducted using a questionnaire that consisted of three profile questions - gender, age, education and questions on a five-point Likert scale for which the respondents asked them to answer to what extent they believe that robots could replace them in the workplace.

A total of 178 respondents participated in the survey, which was conducted in the period from December 2022 to January 2023, of which 52 were men and 126 were women.

The largest number of men and women who participated in the research is up to 25 years old, followed by those between 25 and 35 years old. This implies that young people, who have a long working life ahead of them and who will very likely be surrounded by robots in their workplace in the future, participated in the research. In terms of education, over 90% of men and women have completed university, basic and master's studies, which indicate that the respondents have a high level of education.



Table 1 – Basic information about respondents.

	Men N	Men %	Women N	Women %
Age of respondents				
Up to 25 years	38	73.08	88	69.84
Between 25 and 35 years	9	17.31	21	16.67
Between 36 and 50 years	5	9.61	16	12.69
More than 50 years	0	0	1	0.80
The level of education				
High school	3	5.77	11	8.73
Faculty – basic and master studies	49	94.23	114	90.48
Faculty – PhD studies	0	0	1	0.79

## 5. RESEARCH RESULTS AND DISCUSSION

Respondents had the task of expressing their degree of agreement with the statement "I believe that robots would take out my job" on a scale from 1 (completely disagree) to 5 (completely agree). The results are shown in Table 2 and Figure 1. The largest number of both women and men disagree with this statement. Out of the total number, 65.38% of men do not agree, while the number of women who do not agree with the statement is slightly higher and amounts to 68.26%. This means that about two-thirds of respondents who took part in the research believe that robots will not take over their jobs. On the other hand, there are a certain number of respondents who believe the opposite: 19.23% of men believe that robots could replace them in their workplaces, while 15.07% of women believe the same. It should be noted that a certain number of respondents took a neutral position: 15.38% of men and 16.67% of women.

The mean value of the answers obtained from men and women is less than the threshold value of 3. However, the mean value is slightly higher for men compared to women, as shown in Figure 2.

The results showed that most respondents that participated in this research are "lulled and carefree" and do not see automation as a threat to their jobs. Bearing in mind technological progress, it is necessary to raise people's awareness of the need to acquire knowledge and skills that cannot be automated, such as: critical thinking, problem solving, creativity, communicativeness, cooperation [23], as well as emotional intelligence, ethical principles, curiosity, empathy, and logic [24]. However, it is unknown what new technological advances will bring. For example, unlike industrial robots that mostly performed routine and manual tasks, today robots are increasingly cooperating with people and performing more complex tasks. Advances in the field of artificial intelligence have contributed to robots starting to perform intellectual and non-routine jobs and activities [25]. It is safe to say that robots in the future will be more complex and will have better features and capabilities. For example, robots have built-in sensors that allow them to interpret emotions, then have eyes that look in the direction of the interlocutor and can set appropriate facial expressions according to the feelings of the interlocutor (recognition of danger, stress, fear) [26], [27].

Table 2 – Respondents answer on the statement "I believe that robots would take out my job".

	Men N	Men %	Women N	Women %
Strongly disagree	19	36.54	54	42.86
Disagree	15	28.84	32	25.40
Neither agree nor disagree	8	15.38	21	16.67
Agree	7	13.46	12	9.52
Strongly agree	3	5.77	7	5.55

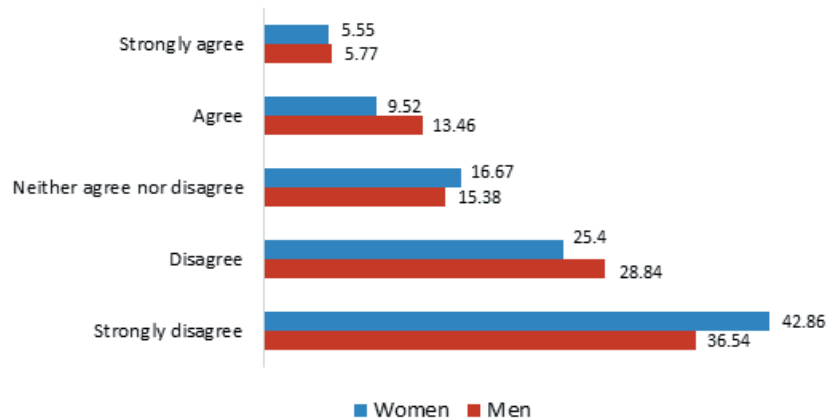


Figure 1 – Respondents answer on the statement “I believe that robots would take out my job”.

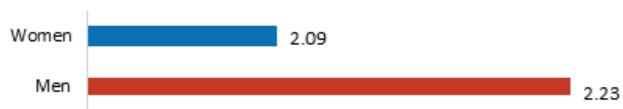


Figure 2 – Mean values for the statement “I believe that robots would take out my job”.

## 6. CONCLUSION

In the digital economy, no job can be said to be immune to new technological solutions, especially to robots and automation systems and machines. The results of the empirical research conducted from December 2022 to January 2023, in which 126 women and 52 men participated, showed that men were slightly more likely to believe that robots could replace them in the future. Out of total, 19.23% of men believe that robots could replace them in their workplaces, while 15.07% of women believe the same. The mean value of answers for men which participated in this research was 2.23, while mean value for women respondents was 2.09. Those differences between men and women are relatively small. Due to that, it may be concluded that, regardless of gender, the largest number of both men and women believe that robots will not take over their jobs (mean values are lesser than 3). Obtained results may indicate that the respondents which participated in this research are quite lulled and feel secure regarding their jobs.

This research is accompanied with some limitations. To begin with, the number of respondents in this study is small and may not represent the entire population. As a result, the obtained results cannot be generalized or applied universally. They may be applied only to the respondents that participated in this research. Second, a five-point Likert scale was used in the survey, which is not always perfectly precise in assessing the complexity

of people's attitudes, particularly on novel topics. Third, the survey only included closed-ended questions, with no opportunity for respondents to write down and express their thoughts and ideas. Due to that, it was not possible to thoroughly examine and analyze their perceptions and attitudes.

In future studies, it would be useful to conduct a longitudinal study and analyze whether the attitudes and perceptions of men and women change in accordance with new technological advances and changes in the work environment. Also, suggestions for future research are to include a larger number of respondents from various spheres of education and job positions.





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