

AI and Human Bias: The Future of Jobs in the Labor Market

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Abstract. *Artificial intelligence has become an increasingly debated topic nowadays, which can lead to many controversies. Many wonder if this technology will end up replacing certain areas of the workplace. For this reason, many people have become skeptical and biased when it comes to using this technology. However, it has been observed that in order to be able to function at high parameters, AI needs data for training. This aspect is very important to analyze in this paper, because a correlation is made between the implementation of artificial intelligence and the number of ICT specialists. For a detailed analysis of this aspect, a simple linear regression was used. This was done using SPSS software. Thus, the DESI 2024 index was used for this study, among 27 countries in the European Union. The results showed a positive correlation, with a statistical representativeness between the adoption of AI and the demand for ICT specialists. The role of this study is to better understand how artificial intelligence can influence the labor market and how important it is in technological and economic evolution.*

Keywords: labor market, future jobs, behavioral economics, human bias, artificial intelligence, AI adoption, automation impact.

Introduction

With the technological evolution, artificial intelligence has become an increasingly used tool both in social activities and in the business environment. It has been observed that AI has a high potential to improve the level of efficiency and productivity both among companies and employees (Abradi et al., 2022). There is also a connection between the level of digital transformation, that of economic growth and automation, as all these aspects emphasize the fact that this technology has the ability to have a positive impact on the development of the business environment. When open access to information and technological collaboration are allowed, new jobs can emerge, the level of skills in the field of work is also improved, but also efficiency (Aly, 2022).

While there are concerns about artificial intelligence, which is often associated with individuals losing their jobs, it also comes with good parts, such as job opportunities in the tech field. For this reason, the demand for ICT specialists is high, as their expertise is needed to be able to integrate and manage all aspects of artificial intelligence. Understanding the relationship between the way artificial intelligence can be adopted and the level of availability among ICT specialists can provide really important information in terms of a better understanding of the demands of the field of work and how it could evolve in the future, in an economy that includes more and more AI.

With the help of the DESI 2024 index, this paper aims to analyze the link between the adoption of AI and the number of ICT specialists in the European Union. The research was based on a simple linear regression to study whether an increase in AI adoption is correlated with an increase in the percentage of ICT specialists in the 27 EU Member States. The main objectives of this study are to analyze the impact of AI on the labor market, but also to emphasize the prejudices that individuals have when using artificial intelligence or are exposed to it in the workplace.

Literature review

As can be seen, artificial intelligence has also brought a number of concerns among people, such as the fact that certain categories of jobs could be replaced or even eliminated. The jobs targeted by this are those that have a repetitive character, where there is a certain routine. However, another approach highlights the fact that jobs that are based on creativity are much less likely to end up being replaced or eliminated, because the social and emotional skills of individuals are still needed. Even though artificial intelligence has shown that it is capable of performing at least decently in these areas, human expertise is still preferable (Abrardi et al., 2022).

Also, artificial intelligence has the ability to increase the level of labor productivity, sometimes even complementing daily human activities. Another aspect to take into account is that AI is constantly improving its ability to make predictions, which can make it easier for individuals to make such decisions, or they can improve their choices based on these predictions (Abrardi et al., 2022).

On the other hand, the way people perceive artificial intelligence nowadays is a complex one, as there are still many prejudices. More specifically, some studies have shown that the use of artificial intelligence in the recruitment process would be beneficial and would even lead to increased efficiency, bringing considerable benefits to companies. However, if we refer to the fact that AI is still a software that can be continuously trained, there is a high chance that it will take over people's prejudices, referring to the data with which it trains. A concrete example of this is Amazon, when in 2018, a recruitment system based on artificial intelligence had to be withdrawn, because it was observed that it had inappropriate, discriminatory behavior against women. This event had a negative impact on the image of the renowned company, but also on the way artificial intelligence is perceived (Steinberg & Hohenberger, 2023).

A study by the World Economic Forum has highlighted the importance of the information and communication technology (ICT) sector, as it has been observed to be an essential factor for the development of the economic environment. Following the analyzes carried out, it was found that this sector has a significant contribution in relation to GDP, reaching a growth of 1.4% if we refer to economies that are in a period of development, but has the capacity to reach up to 2.5% in the case of China (Aly, 2022). However, the benefits of digitalization are not always visible in the moment, but rather they bring improvements over time, making the economy grow in a healthy way (Park & Choi, 2019).

There are also studies that show that artificial intelligence can also be seen as a factor of production, which can lead to a growing and developing economy. For example, AI can create the virtual workforce, and the efficiency is much higher than in the case of traditional workforce. This aspect comes to the aid of companies, which will record lower operational costs. This aspect should not create panic among individuals, as this technology can also work in a complementary way, combining physical capital, respectively human resources with technology (Aly, 2022).

Over time, there have been concerns about the impact of artificial intelligence on the labor market, as technological evolution has been a topic of interest since ancient times, such as when Aristotle showed the world the effects of mechanized actions on human labor. This idea was also addressed by John Maynard Keynes, who presented the concept of technological unemployment. Schumpeter also said that technological progress also comes with a series of imbalances at the economic level, which can lead to structural transformations, but also to periods when the growth recorded is not equal. Among the aspects observed to be influenced by artificial intelligence are the introduction of new technologies that have effects on the way they carry out their work or on the other hand, there is also the fear of individuals that artificial intelligence will lead to the loss of

the jobs they have. Automation is an essential aspect for a company that wants to have good results and low costs. However, it was observed that the impact of AI on the labor market was positive, as it reduced the workload, and people had more time for other activities, getting rid of repetitive tasks (Aly, 2022). However, research has shown that there will be a change in the relationship between humans and advanced technology not only in terms of the role that artificial intelligence can play in our lives, but also in terms of the fact that a set of digital skills is increasingly needed to keep up with this technological evolution. At the same time, it is not excluded that temporary jobs will appear more and more often, leading to instability, and employees will be left without that job security. The main problem could be for migrants looking for a job in another country, as they already had difficulties in finding a job in terms of the documents needed to work legally or linguistically. In their case, technological evolution in the first phase will not help them, but will make their situation more difficult, making them feel insecure and frustrated (Aydin et al., 2024).

On the other hand, studies show that people prefer to be served at tables by people and not by robots. However, if they are in an awkward situation, they will prefer interaction with a robot, artificial intelligence, because they will not feel as judged as in the case of another person. However, an important aspect to mention is that in the case of robots, artificial intelligence should not attribute human traits to them, as people's perceptions in this case can change (Noble & Mende, 2023).

At the same time, there are examples that show that artificial intelligence has changed the way companies offer certain services to customers. One can refer to Amazon's Prime Air, a service that makes drone deliveries within 30 minutes of placing the order. The drones work based on an artificial intelligence system, which constantly trains, learning new things, such as avoiding obstacles, how to adapt their flight to weather conditions, but also various route routes, so as to obtain the optimal time. It has been observed that as the system trains and stores more useful information and its abilities become better. Although this service may be seen by many people as a threat to the classic courier job, it can still be an effective solution for those who want to shop, but do not have much time (Kumar et al., 2024).

The ethics of using artificial intelligence should not be neglected either, as many employees use this technology to make their work tasks easier, without declaring it. The fear of admitting is the main factor that prevents them from being honest, as many believe that if they admitted that they used this technology they would no longer be considered good and original employees (Liu & Chilton, 2022). However, there are also forms of creativity where individuals and AI work together, such as message engineering, specifically the ability to formulate certain requests so that AI generates the desired result. In order for all these things to evolve in a healthy and beneficial manner for the economic field, every company should have clear rules and regulate the use of artificial intelligence for employees (Magni et al., 2023).

The term digital capitalism has also been discovered, which has developed with the digital economy in recent years. It is well known that there is a transition from the classical to the digital economy, and this is increasingly taking shape through the use of artificial intelligence. Even though technology can sometimes have a negative impact on certain jobs, it still has remarkable benefits, such as flexible working hours and the use of artificial intelligence for certain social or economic aspects (Oztas, 2024).

Methodology

The methodology of this research is based on analyzing the relationship between the adoption of artificial intelligence (AI) technologies and the number of ICT specialists at the level of the

European Union, starting from the data provided by the DESI 2024 index. Also, by using a linear regression model, it will be analyzed how the increase in the adoption of artificial intelligence can have an influence on the number of ICT specialists.

Thus, the aforementioned data was collected for 27 countries + general average in EU, which are members of the European Union (Austria, Belgium, Bulgaria, Cyprus, Czechia, Germany, Denmark, Estonia, Greece, Spain, European Union, Finland, France, Croatia, Hungary, Ireland, Italy, Lithuania, Luxembourg, Latvia, Malta, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia). At the same time, the data were downloaded through the DESI platform, and later processed in Microsoft Excel. After centralizing the data, the Excel file was introduced into the SPSS Software, with the aim of performing linear regression. In order to establish the initial link between the chosen variables, a Pearson correlation test was performed. Its role is to measure the intensity, respectively the direction of the linear link between the adoption of artificial intelligence and the percentage of ICT specialists. As a result of the research, a positive correlation of 0.593 was found, which is statistically significant because the p value is less than 0.05, which highlights a moderate relationship between the two variables.

Also, the linear regression model is made up of a dependent variable such as ICT specialists and an independent variable AI adoption. AI has been considered an independent variable because it has a direct impact on the number of ICT specialists, even if there are other factors that can influence it. At the same time, as artificial intelligence is implemented, the level of competence in areas such as programming, machine learning, etc. increases. The evaluation of the model was carried out using several statistics such as R^2 , the regression coefficient, and the ANOVA test.

At the same time, the research started from the following hypothesis:

H0: There is no statistically significant and positive correlation between AI adoption and the percentage of ICT specialists in the European Union

H1: There is a statistically significant and positive correlation between AI adoption and the percentage of ICT specialists in the European Union

Results and discussions

Following the regression analysis, a moderate correlation was found between the frequency of AI use and the number of ICT specialists ($r = 0.593$, respectively $p < 0.001$). Also, the Beta coefficient = 0.239 shows us that if the use of AI were to increase gradually, then a link could be created with the proportional increase in the number of ICT specialists, of about 0.239%.

Although this link is statistically significant, at its base it contains many more elements, being part of a complex phenomenon. Technological development, especially that related to artificial intelligence, has a significant contribution in terms of creating new jobs in the digital sector, but it is not the only factor that can have this effect. Also, tools such as artificial intelligence software have the ability to streamline work and create new tasks, the increase in the number of ICT specialists may also depend on other factors such as how well-prepared organizations or educational systems are, but also on the fact that there must be a demand on the market.

Studies in the field emphasize the fact that there must be a well-trained workforce so that it can be possible to successfully integrate new digital technologies. Our statistical model explains around 35.1% of the observed variation, which highlights that there are other external factors that were not taken into account for this analysis. This lays the foundations for future research for the development of the current model, so that other variables are included to cover a wide range of aspects.

Descriptive Statistics

	Mean	Std. Deviation	N
ICT Specialists (%)	5.00	1.587	28
AI Adoption (%)	8.21	3.938	28

Correlations

		ICT Specialists (%)	AI Adoption (%)
Pearson Correlation	ICT Specialists (%)	1.000	.593
	AI Adoption (%)	.593	1.000
Sig. (1-tailed)	ICT Specialists (%)	.	.000
	AI Adoption (%)	.000	.
N	ICT Specialists (%)	28	28
	AI Adoption (%)	28	28

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.593a	.351	.326	1.303	.351	14.075	1	26	.001

a. Predictors: (Constant), AI Adoption (%)

ANOVA^a

	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	23.883	1	23.883	14.075	.001b
	Residual	44.117	26	1.697		
	Total	68.000	27			

a. Dependent Variable: ICT Specialists (%)

b. Predictors: (Constant), AI Adoption (%)

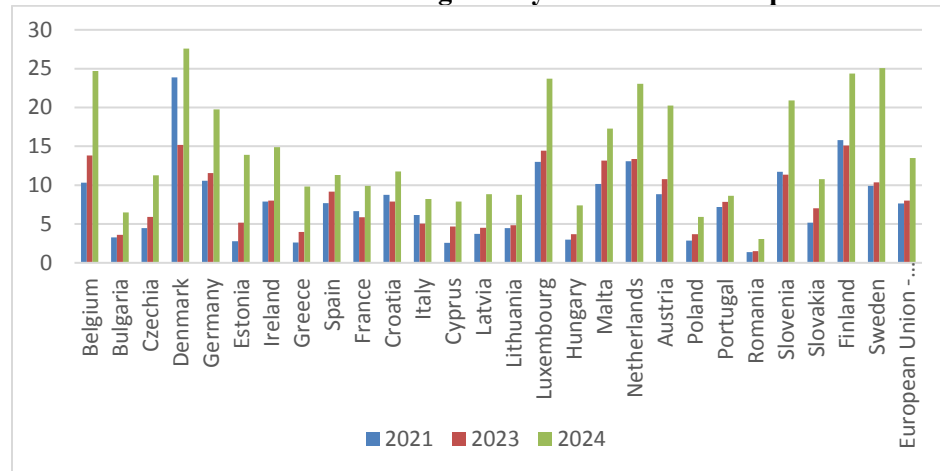
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.038	.578		5.257	.000
	AI Adoption (%)	.239	.064	.593	3.752	.001

a. Dependent Variable: ICT Specialists (%)

Thus, following the analysis undertaken, it is found that the hypothesis H1 is valid, respectively H0 is null. It is appreciated that innovation-based digital technologies, such as artificial intelligence, have a significant impact on life and the business environment. Among the potential effects are the reduction of costs in terms of computers and IT tools, the expansion of internet access among the population, but also the increase in the number of specialists in the technological field. At the same time, it is not to be neglected that an extensive use of intelligent technological products and services is desired, such as autonomous cars, whose main presentation feature is the reduction of human error (Aly, 2022).

Chart 1. Artificial intelligence by size class of enterprise



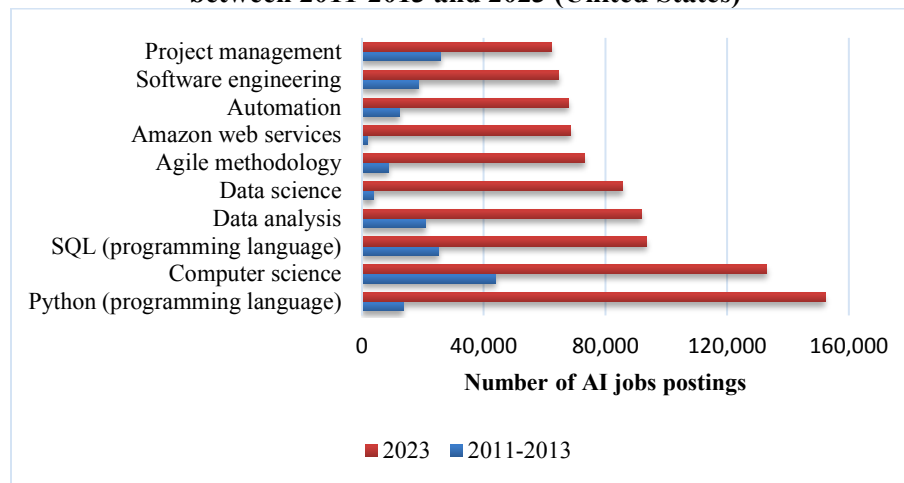
Source: https://ec.europa.eu/eurostat/databrowser/view/isoc_eb_ai/default/table?lang=en

In chart 1 it can be seen that there is an increasing trend in the use of artificial intelligence in most of the analyzed countries, which highlights the importance of developing and implementing new technological tools.

In 2024, artificial intelligence was adopted the most in countries such as Denmark, Sweden and Luxembourg, registering percentages around 25% among companies. Germany, the Netherlands and Finland are also worth mentioning, as they have registered increases, having between 15 and 20%, this is also due to the fact that these countries have constantly invested in digitalization processes, and are currently among the countries with the best technological development. On the other hand, countries such as Romania, Bulgaria, Greece and Cyprus recorded data below 10%, which underlines the need for technological development in these countries and the fact that major investments in the digital sector are needed to have visible results.

If we look at the long term, the higher the level of investments in the digital sector, the more and more specialists in the ICT sector will be attracted, which will lead to a development both technologically and economically. On the other hand, countries that have recorded low rates may lag behind in this digitalization race, which can have negative effects on the level of economic competitiveness, but also in terms of employment.

Chart 2. Top 10 specialized skills in AI job postings: A comparison between 2011-2013 and 2023 (United States)



Source: <https://hai.stanford.edu/ai-index/2024-ai-index-report>

In chart 2 it can be seen which are those skills that registered significant increases in 2023 compared to the period 2011-2013, which can be analyzed from the perspective of the fact that artificial intelligence has continuously developed and has been integrated by many fields, such as IT. In 2023, among the most sought-after skills were Python and SQL, being those programming languages that are of high importance to be able to develop and implement AI-related algorithms. Also, fields such as computer science, data science, and data analysis highlight the importance of data analysis and mathematical modeling in AI applications.

The increase in posts for software engineering or project management skills suggests that the implementation and development of artificial intelligence is based on well-structured processes, and organizations are adopting these aspects more and more often, emphasizing good planning and efficient execution. The massive increase in AI skills in the US may also indicate a global trend, as the level of influence of the American economy is well known. For these reasons, it can be assumed that the aforementioned trend can be correlated with the adoption of AI and the impact on ICT specialists in the European Union, especially since in recent years there are specialized programs on digitalization and artificial intelligence at the level of the European Union, such as the AI Act or the Digital Europe Program. As there is an increased demand for the implementation of AI technologies at the level of companies, this is also transferred to specialists in the field, as they want to hire people who have advanced programming, data analysis or cloud computing skills. Moreover, despite the biases among some people that AI will replace more and more jobs, making human work automated, it has been observed that this technology also works as an incentive for people to progress and become better and better. Some do this for fear of losing their job and implicitly of falling behind with technology, others implement it because they consider it natural and an important step in the development of their own career.

Conclusion

Artificial intelligence has come to play a very important role both in people's daily lives and in the case of companies. Its large-scale implementation can make certain individuals worried, as they believe that this technology puts their jobs at risk. Indeed, artificial intelligence can especially replace those jobs that have a repetitive, routine character. But, on the other hand, this technology

also has a number of benefits, as it helps people have more free time, taking over tasks that they find boring or unmotivated, and from an economic and technological point of view, it helps companies to progress, all these things at lower costs.

The public perception of artificial intelligence is complex and varies from case to case. There are people who are excited about this technology, who have integrated it both into their daily lives and into the workplace. While other people consider it a threat in terms of the automation it is capable of. However, the use of artificial intelligence in areas such as human resources signals a number of concerns about people's biases, as this software is one that needs continuous training in order to be improved, and if this training is based on people's biased data, then the software will eventually end up projecting similar behavior.

Following the analysis of the relationship between the adoption of artificial intelligence and the percentage of ICT specialists, it was observed that there is a statistically significant link and that this technology highlights the need for specialists in the field, as there is a high demand on the labor market for digital skills that are complementary to this new technology.

In the long term, artificial intelligence will continue to have a significant impact on the lives of people and the business environment. It depends on each individual how they decide to implement it and adapt to this technological revolution, but for things to be considered ethical and free of interpretations, a good regulation of artificial intelligence is necessary, so that technological and economic progress is ensured.

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