The impact of artificial intelligence on the labor market over the next 10 years

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Abstract

Artificial intelligence (AI) is about to radically redefine the labor market, and over the next 10 years, the changes will be profound and irreversible. This article explores how AI will influence the workforce, analyzing both the jobs that will disappear due to automation and the new professions that will emerge as a result of this technological revolution. While traditional sectors such as manufacturing, transportation, and services will be most affected by automation, new areas of activity will flourish, focusing on the development and maintenance of emerging technologies, digital ethics, and complex data analysis. Emphasis will also be placed on the forced retraining of employees to meet new market demands, as well as on the importance of continuing education to ensure the smoothest possible integration of new technologies into organizations and society. The ethical and social challenges of this transition will also be addressed, in particular the risks related to algorithmic discrimination, unequal access to new opportunities, and the economic impact on the most vulnerable segments of the population. The article concludes with a discussion of the need for effective public policy to regulate the use of AI while protecting workers' rights and ensuring a sustainable future for all citizens. As AI continues to shape the global economy, it will be essential for both employers and employees to actively prepare for these changes and work together to navigate the challenges and opportunities brought about by new technologies.

Objectives

To analyze how AI will transform industries and jobs over the next decade, identifying professions that will disappear and those that will emerge as a result of automation and emerging technologies. To define a framework for action for employers and employees to actively adapt to technological change, ensuring that the transition to AI is effective and does not negatively affect social and economic stability. Thus, addressing concerns about algorithmic discrimination, social inequalities created by automation, and the impact of technologies on the most vulnerable segments of the population.

Results

The expected outcomes of the article are a complex and nuanced understanding of the profound transformations that AI will bring to the labor market over the next 10 years, highlighting both the disappearance of certain professions and the emergence of new professional fields; a clear awareness of the need for continuous retraining and adaptation of skills to new technologies; a reflection on the ethical, social, and economic challenges generated by process automation and the risks of deepening inequalities; o encouragement of the development of innovative public policies that protect workers' rights and support a fair transition to a digital economy; and, last but not least, the creation of a framework for action for employers and employees that supports the harmonious and sustainable integration of artificial intelligence into existing economic and social structures. Artificial intelligence in Romania has significant transformative potential for the economy and the labor market, with remarkable progress in the private

sector, where start-ups and multinational companies are developing innovative solutions, and in education, where more and more programs dedicated to training specialists are emerging. but the challenges remain considerable, including insufficiently developed digital infrastructure in rural areas, the need for massive retraining of the workforce to meet the demands of an automated economy, the lack of a clear legislative framework to regulate the ethical use of AI and the protection of personal data, as well as the risks of deepening social and economic inequalities. The success of a sustainable and equitable transition to a digital era depends on effective collaboration between government, educational institutions, and the private sector to build an ecosystem that supports innovation while protecting citizens' rights and ensuring equitable access to new technologies.

Value

The value of the article lies in its ability to provide a comprehensive and well-documented overview of the impact of artificial intelligence on the Romanian labor market, identifying both the challenges and opportunities created by these emerging technologies. The article helps readers understand not only the immediate effects of AI on industries and the workforce, but also the long-term social, economic, and ethical implications, providing relevant analysis for decision-makers, entrepreneurs, professionals, and politicians. Furthermore, by proposing solutions for retraining and protecting workers, creating appropriate public policies, and integrating AI fairly, the article serves as a guide for managing the transition to a sustainable digital economy. In addition, it contributes to the necessary debate around ethics in technology and personal data protection regulations, strengthening public understanding of the importance of responsible AI development in Romania.

Key words: artificial intelligence, digital automation, technological innovation, data protection, social inequalities, the future of work, algorithmic discrimination.

Introduction

Artificial intelligence (AI) is one of the most significant technological revolutions of the 21st century, having a profound impact on global economies and, implicitly, on the labor market. While AI is already integrated into various industries in many developed countries, Romania is at a crossroads, with the opportunity to adopt and adapt these technologies to its specific economic and social context. The transformations brought about by AI are complex and are not limited to process automation or the development of new technologies. They directly influence the structure of the labor market, how jobs are created, and how the work process is organized. In Romania, as in other emerging economies, AI can be a catalyst for progress, but also a source of major challenges.

On the one hand, AI offers immense opportunities for innovation and economic growth. Tech start-ups are already a reality in Romania's major cities, and multinational companies are increasingly investing in automated solutions and integrating AI into their business processes. These changes promise to create new jobs in emerging fields such as algorithm development, data analysis, and business intelligence. At the same time, the implementation of AI in sectors such as healthcare, education, and public administration can lead to increased efficiency and improved quality of public services.

On the other hand, the impact of automation and AI on traditional jobs is an inevitable reality. Many industries that rely on unskilled labor or repetitive tasks will be severely affected. New challenges will also arise related to the forced retraining of employees and the protection of vulnerable jobs. In this context, Romania will have to face major challenges, including in the areas of education, digital infrastructure, and legal

regulations, in order to ensure a fair transition to a digital economy.

In this article, we will analyze how the Romanian labor market will evolve over the next 10 years under the influence of AI, which areas will be most affected, how the risks of inequality can be addressed, and what solutions exist for integrating AI in a sustainable and equitable manner. We will also explore the importance of education and continuous retraining for the workforce, as well as the need for a legislative framework that protects workers' rights in an increasingly automated world. Finally, the article aims to contribute to a constructive dialogue between governments, companies, and society regarding the future of work in the age of artificial intelligence.

The impact of AI on the Romanian labor market

Artificial Intelligence (AI) will have a significant impact on Romania in the coming decades, bringing both challenges and opportunities in various sectors of the economy and social life. One of the most obvious effects of AI will be the automation of jobs in industries such as manufacturing, transportation, retail, and logistics, leading to the loss of traditional jobs, especially for people with low skills. However, AI will also contribute to the creation of new jobs in areas such as software development, data analysis, machine learning, and AI ethics. This process will require a reskilling of the workforce, and Romania will need to invest significantly in digital education and continuous training to avoid structural unemployment, especially in rural areas where access to education is limited. At the same time, AI will accelerate the digitization of the Romanian economy, improving efficiency in sectors such as healthcare, agriculture, and financial services. For example, in the healthcare system, AI can support rapid diagnosis of diseases and personalization of treatments, and in agriculture, drones and sensors will improve crop monitoring and natural resource management. In finance, AI will help analyze consumer behavior and create more efficient and personalized credit systems.

In terms of education, AI can address issues of access to education and create personalized learning platforms tailored to the needs of each student. However, Romania faces a digital divide between urban and rural areas, and this gap can lead to inequalities in access to quality education and training. AI will also influence the public sector, improving administrative and bureaucratic services through automated systems for processing citizens' requests and the use of chatbots for support. In this context, Romania needs to develop clear regulations to ensure the responsible and ethical use of AI technologies, preventing algorithmic discrimination and protecting the confidentiality of citizens' personal data.

Another important aspect of AI's impact will be in the field of investment. Romania has the potential to become a regional hub for technological development, given its competitive labor costs and the continuous growth in the number of IT professionals. Cities such as Cluj-Napoca, Bucharest, and Timișoara are becoming centers of innovation, and investments in startups and technological infrastructure are constantly growing. Romania must place a strong emphasis on developing a robust digital ecosystem to attract foreign investment and support the growth of local technology startup- s.

In conclusion, the implementation of AI in Romania will profoundly transform the country, with significant effects on the labor market, the economy, and the public sector. The challenges related to job automation and the forced retraining of employees will require well-thought-out strategies, including investments in education and digital infrastructure. At the same time, AI can represent a major opportunity to improve public

services, increase economic efficiency, and create jobs in innovative fields, enabling Romania to become a regional leader in emerging technologies. With a responsible and strategic approach, Romania can benefit significantly from the technological revolution and ensure a fair and prosperous transition to a digital age.

Table 1. Exposure to AI by sector and opportunity

Sector	**Type of AI Exposure**	**Net Risk (10 years)**	**Net Opportunity (10 years)**
Manufacturing	Process automation, computer vision quality control	medium–high	high
Health	Assisted diagnosis, triage, NLP for medical documents	low–medium	high
Financial	Credit scoring, fraud detection, virtual assistants	medium	high
Public Administration	Digital workflows, RPA, citizen service chatbots	low–medium	medium
Retail & E-commerce	Recommendations, dynamic pricing, demand forecasting	medium	high
Agriculture	Agritech, IoT sensors, drones,yield forecasting	low	medium

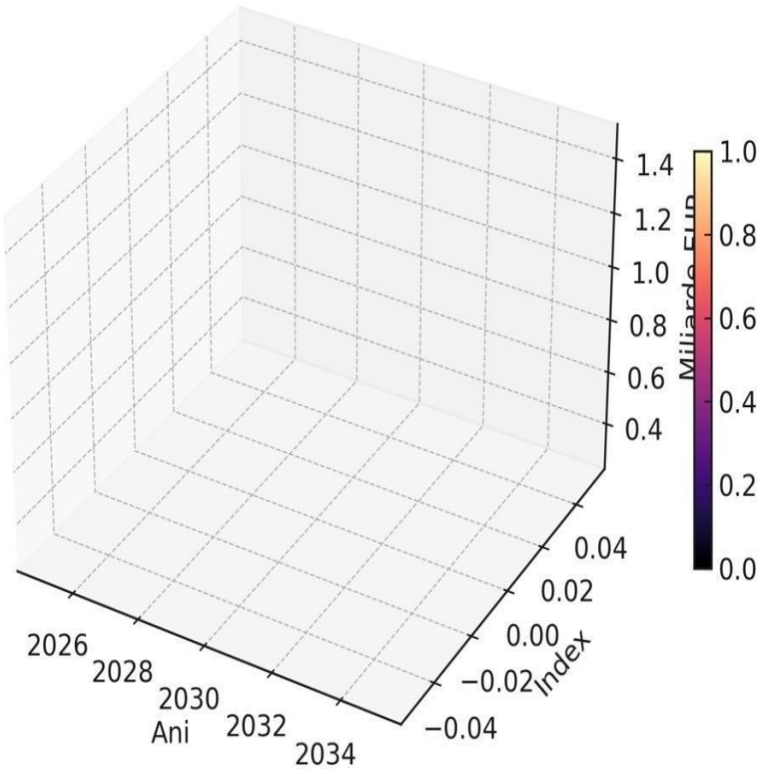

Fig 1. AI adoption in Romania by sector: 2025 vs 2035
Source: https://rwea.ro/wp-content/uploads/2021/03/20190307_RES_Roadmap_2030.pdf

The local AI ecosystem comprises ~146 product companies and 49,000 professionals directly involved in AI (2024). Public initiatives (e.g., automation of AFIR processes with RPA/AI technology) and a national strategic framework are underway. At the same time, artificial intelligence imposes differentiated risk requirements relevant to health, finance, administration, transport, and retail. Artificial intelligence will become an essential component of the Romanian economy with a strong impact on productivity, efficiency, and innovation in almost all sectors.

Significant productivity gains are expected as AI matures. For Romania, we model an AI contribution to GDP growth that intensifies as adoption moves out of pilot and into scale operations.

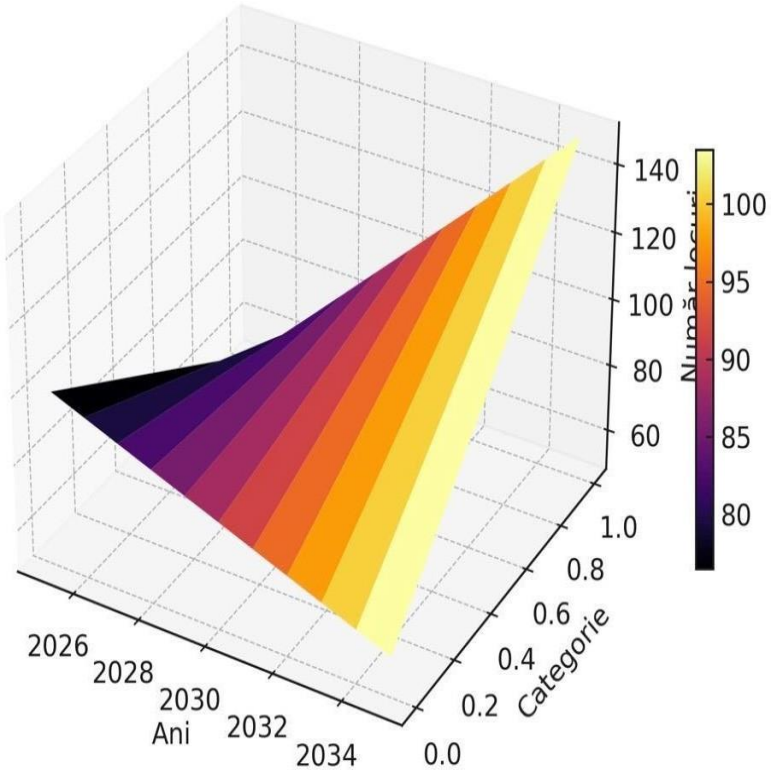

Fig 2. AI contribution to Romania's GDP growth (pp/year, 2025–2035, projection).
Source: https://www.weforum.org/publications/the-future-of-jobs-report-2025/

Artificial intelligence (AI) is causing a structural redistribution of tasks and a progressive redefinition of occupations in the labor market. In the absence of appropriate interventions, exposure to automation processes remains significantly higher in sectors with standardizable activities, such as manufacturing and retail. However, the implementation of active employment policies, retraining programs, and digital skills development initiatives can generate a compensatory dynamic through the emergence and expansion of emerging roles in areas such as data analysis, AI engineering, digital ethics, cybersecurity, and systems integration. In a favorable scenario, these emerging occupations could cumulatively exceed the volume of jobs at risk of automation in the second half of the current decade.

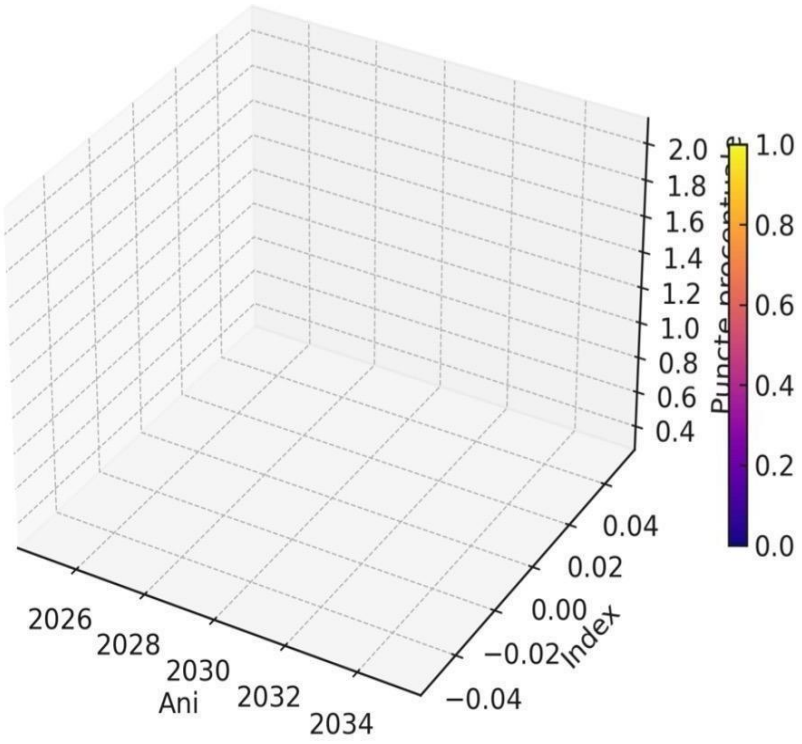

Fig. 3. Job balance: jobs at risk vs. new roles
Source: https://www.startupblink.com/startup-ecosystem/romania?page=1

In Romania, approximately 12% of jobs are at high risk of automation, particularly in standardizable sectors such as manufacturing and retail. but by investing in reskilling and digital skills development, the growing demand for emerging roles in areas such as data analytics, AI engineering, digital ethics, cybersecurity, and systems integration has the potential to offset and even exceed these losses in the second half of the decade. Investments are modeled at a nominal annual growth rate of 20% for combined public and private funding, starting from an illustrative base of €0.25 billion in 2025. The projected investments support the growth of start-ups, the digitization of the public sector, and partnerships between universities and industry.

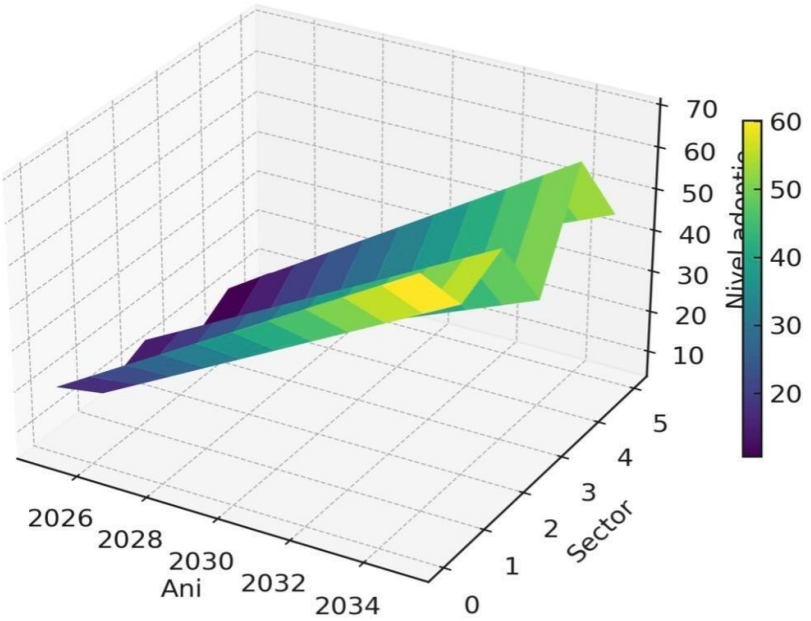

Fig. 4. Projected Public/Private Investment in AI (Romania, 2025–2035)
Source: https://www.oecd.org/en/publications/oecd-employment-outlook-2023_08785bba-en.html

Public policy measure (Romania)	*Outcome indicator*
Extend National AI Strategy to 2035; implement roadmaps for sectors	No. of projects implemented/ maturity score
SME compliance support: guidelines, sandbox, documentation templates	% of SMEs compliant / no. of sandbox tests
National reskilling program (micro-credentials)	No. of courses and graduates/placement rates
Open high-value public datasets (open data)	No. of datasets; reuses /year
Pro-innovation procurement and PCP	No. of PCPs / cost savings
AI co-investment fund (public-private)	Cofinanced volume; no. of startups supported

We can see a link between a specific public policy measure adopted in Romania and the indicator that assesses its real effect on society or the economy. Thus, we have:

Public policy measure (Romania) → represents **the concrete intervention** adopted by the state or a public institution to achieve an objective (e.g., digital reskilling programs, innovation subsidies, youth employment policies, etc.).

Outcome indicator → measures the effect (result) of that policy on society or the economy, as opposed to *output* (which is the immediate product, e.g., "number of people trained"). The outcome measures the impact, i.e.**, what has actually changed** as a result of the policy (e.g., "employment rate in digital fields after 6 months," "increased productivity in technology-based SMEs," etc.).

Conclusions

Romania is at a decisive moment where it can transform artificial intelligence from a technological challenge into a systemic competitive advantage, provided that investments in human capital, digital infrastructure, the data ecosystem, and the regulatory framework are synchronized, as the success of AI integration depends not only on the adoption of emerging technologies, but above all on the institutional capacity to stimulate continuous learning, adaptability, and cooperation between the public, private, and academic sectors. In this context, the extension of the National Strategy for Artificial Intelligence until 2035 should include a national AI skills program for employees and civil servants, a regulatory sandbox to enable the safe testing of innovations in strategic sectors such as energy, health, agriculture, and public administration, as well as the opening of high-value public datasets to facilitate the development of local solutions. At the same time, co-financing policies for SMEs should support the adoption of AI technologies and the creation of data-driven value chains, thereby reducing regional disparities and boosting productivity.

Romania needs a digital governance framework that ensures ethics, transparency, and data protection, strengthening public confidence in the use of AI, while the monitoring system through annual indicators of impact on the labor market, productivity, and innovation would allow for dynamic adjustment of interventions and calibration of public policies based on results. Through such an integrated approach, Romania can mitigate the risks of social polarization, capitalize on the emerging opportunities of the digital economy, and position itself, by the middle of the next decade, as a competitive and responsible regional player in the use of artificial intelligence.

Proposals

- Extending **the National Strategy for Artificial Intelligence (SN-IA) until 2035**, with clear medium- and long-term objectives, integrated with industrial, educational, and digital policy.
- Creation of an **AI governance framework** to ensure ethics, transparency, data protection, and cybersecurity.
- Establishment of an **intersectoral advisory council** (state, private sector, academia, civil society) to evaluate and adjust AI policies.
- Launch a **national AI skills program** for private sector employees and civil servants to develop digital, data science, and machine learning skills.
- Support for **the retraining of the workforce** in sectors at risk of automation.
- Creation of a **regulatory sandbox** for testing AI applications in strategic sectors (health, energy, agriculture, public administration).
- Encouraging public-private partnerships for **research and development** in areas with strategic impact.
- Creation of **regional AI innovation hubs** to attract talent and reduce territorial disparities.
- Establish **annual indicators** for the labor market, productivity, AI adoption, and social impact.
- Continuously evaluating policy effects and dynamically adjusting interventions to maximize results.

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