The Impact of Artificial Intelligence on Occupations Requiring Higher Education in Romania

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Abstract

The swift evolution of artificial intelligence (AI), especially in fields involving generative capabilities and automation processes, is significantly reshaping employment landscapes across the globe. This paper explores the economic ramifications of occupational shifts driven by AI, focusing on job displacement, changes in required skill sets, and the emergence of new occupational categories. Drawing upon conceptual frameworks and a comprehensive review of existing scholarship, this analysis outlines dominant paradigms of job substitution and complementarity, as well as the capacity of current labor regulations to accommodate such structural shifts. The evidence suggests that, although AI poses considerable risks to roles involving repetitive or routine activities, it also creates new opportunities for alternative employment models and increases the need for advanced digital proficiency. The study concludes by offering strategic recommendations for educational and economic reforms designed to support an equitable and responsive adaptation to an AI-influenced labor environment.

Key words: Digitalization, workplace transformation, workforce adaptation, digital skills
J.E.L. classification: E24, O11, O15, O30

1. Introduction

Artificial intelligence (AI) and its broader impact on global economies can be analyzed through various theoretical and empirical frameworks, each providing unique and critical perspectives. Among these perspectives, the effect of AI-driven innovations on labor structures emerges as one of the most crucial dimensions. Consequently, labor economics has become a focal point for research on automation, robotics, digital transformation, and other innovations shaping employment trends.

Since AI and related technologies can now replicate a broad array of tasks once carried out by humans, their widespread adoption may lead to notable disruptions within certain sectors. The anticipated influence of AI on employment is considerable, with the potential to displace specific roles while simultaneously fostering the emergence of new professions. However, this period of transition may pose serious challenges for employees, who may be required to undergo reskilling or upskilling to remain viable in an evolving job market.

A study conducted by McKinsey sought to estimate AI's broader economic effects on a global scale. Their projections suggest that, by 2030, AI could add approximately $13 trillion to worldwide economic output, primarily through productivity improvements and associated mechanisms. Nonetheless, several barriers could decelerate the integration and diffusion of AI technologies. For instance, organizations that lag in AI adoption may struggle to develop necessary infrastructure or compete for skilled talent. Furthermore, the benefits and disruptions associated with AI are expected to vary across companies, employees, and national economies, making it more difficult to achieve equitable outcomes. Rather than progressing at a uniform pace, the influence of AI is likely to unfold

asymmetrically across regions and industries. In sum, while AI holds promise for enhancing global economic performance, realizing its full potential requires addressing structural disparities among workers, businesses, and countries.

As previously emphasized, one of the most profound aspects of artificial intelligence's economic influence lies in its relationship with labor markets. The implications of AI for employment are complex, presenting both significant obstacles and emerging possibilities. Automation has the potential to take over numerous occupational tasks, which could lead to workforce reductions in certain industries. At the same time, AI can augment job performance and generate entirely new occupational avenues. New professions linked to AI—such as developers of digital assistants, automation strategy experts, and marketing analysts utilizing AI technologies—are anticipated to expand in prominence.

The extent to which AI systems either displace human labor or serve as a complement to it will play a decisive role in determining the net impact across different occupational domains. This ongoing interaction is often described through the lens of a tension between automation and augmentation.

The objective of this article is to investigate the impact of AI-enabled technologies on highly educated labor segments in Romania. It commences with a brief synthesis of relevant academic literature, summarizing principal insights from recent empirical work. Building on this theoretical groundwork, the paper then undertakes a detailed analysis of the short- and long-term repercussions of AI integration on employment structures. In its concluding section, the study proposes an evaluative model designed to highlight the professions most at risk of disruption by tools like ChatGPT. The article aspires to deepen the understanding of AI-induced labor transformations and offer evidence-based guidance for decision-makers and stakeholders aiming to navigate the challenges of technological acceleration in the world of work.

2. Literature review

The relationship between automation and the labor force has been the subject of extensive inquiry within labor economics. Several contributions indicate that automation can displace jobs, particularly those involving routine-based activities. This displacement may cause increases in joblessness, stagnant wages, and heightened income disparities (Berg, Buffie & Zanna, 2016). For instance, research by Moll, Rachel, and Restrepo (2022) suggests that emerging technologies tend to favor capital owners and highly qualified professionals, thereby amplifying inequality through disproportionate gains in capital-based earnings. Their analysis shows that technological substitution can elevate wealth returns while exerting downward pressure on earnings at the lower end of the income distribution.

In contrast, other scholars argue that automation might yield positive employment effects by generating demand for highly skilled labor and enhancing economic productivity. A study conducted by Aghion, Antonin, Bunel, and Jaravel (2022) offers a balanced perspective, weighing the job-displacement risks against the productivity benefits of automation. They posit that automation may bolster employment by making firms more efficient and capable of expanding into new markets.

Hassel, Ozkiziltan, and Weil (2022) investigate automation's impact across various skill groups. Their findings suggest that individuals with advanced skills generally experience favorable employment outcomes, whereas mid-skilled workers are more likely to encounter adverse effects. Outcomes for low-skilled employees are less predictable. The conclusions are sensitive to methodological differences, particularly when analyses rely solely on occupational classifications.

In summary, current research highlights the nuanced and multifaceted nature of automation's impact on the workforce. The consequences depend on factors such as the pace of technological integration, the scope of affected industries and roles, and the accessibility of retraining and upskilling programs. For instance, Graetz and Michaels (2018) analyze data from a range of countries and sectors and find that the incorporation of robotics has had a pronounced, though heterogeneous, effect on employment, varying by national context and industry.

Artificial intelligence and the labor market

The effects of artificial intelligence (AI) on employment trends have become a central topic in labor economics, prompting ongoing discussions and empirical investigations. Several academic contributions suggest that AI may result in workforce reductions, particularly among occupations involving routine and repetitive functions, drawing parallels to earlier waves of automation (Acemoglu, Author, Hazell, & Restrepo, 2020).

Conversely, other studies emphasize the potential of AI to stimulate the creation of new employment avenues, particularly for individuals in specialized and knowledge-intensive roles. AI's capacity to handle repetitive processes can enable employees to engage in tasks requiring greater cognitive or creative input. For instance, in a study by Acemoglu, Author, Hazell, and Restrepo (2022), the authors utilized U.S. firm-level data on online job advertisements from 2010 to 2018 to examine the labor market implications of AI deployment. Their analysis revealed a substantial rise in AI-related job listings among firms engaged in tasks suited to current AI functionalities. These organizations reported reduced hiring for non-AI roles and evolving skill requirements for remaining positions. However, when analyzing overall employment and wage patterns in occupations and sectors exposed to AI, the aggregate effects remained statistically insignificant.

Although firms that have adopted AI exhibit internal changes in task structures and skill demands, the authors did not find a measurable correlation between AI implementation and broader labor market outcomes such as employment levels or wage adjustments. These findings suggest that, while task restructuring is evident within affected enterprises, the macroeconomic implications of AI have yet to materialize in a detectable way.

In a complementary study, Damioli, Van Roy, Vertesy, and Vivarelli (2023) explore how AI development—particularly as a driver of product innovation—affects employment across sectors. Their analysis relies on data from more than 3,500 firms worldwide that registered AI-related patents between 2000 and 2016. The findings indicate a statistically significant positive relationship between AI-based innovation and job creation, suggesting that AI-driven technological advancement can be employment-friendly.

In a separate contribution, Webb (2019) introduced a novel framework for assessing how various technologies, including AI, influence occupational structures. His method relies on the textual similarity between occupational descriptions and technology capabilities to determine task vulnerability to automation. Applied historically to software and industrial robotics, the model demonstrated a decline in job availability and earnings in occupations with high exposure to automation. However, when applied to AI, Webb found that this technology targets predominantly high-skill tasks and may, in contrast to earlier innovations, contribute to a reduction in income inequality. Nevertheless, the author emphasizes the substantial uncertainty surrounding AI's long-term impact, suggesting that this work is only a preliminary step in understanding how AI may shape the labor market. He also underscores the importance of complementary factors such as workforce adaptability, education systems, and indirect mechanisms like innovation spillovers and skill development in shaping outcomes.

Focusing on national-level dynamics, Genz and Schnabel (2021) examined how digitalization affects individual employment outcomes using linked employer-employee data from Germany. Comparing workers in digital-investing establishments with those in non-investing counterparts, they found reduced employment stability among the former group. However, most displaced workers managed to transition to new roles in other companies. The study also uncovered variation in impact across workforce segments, with the most significant changes affecting both highly skilled and low-skilled workers, those performing non-standard tasks, and female employees. These findings highlight the pressing need to bridge the digital divide across demographic and occupational lines.

In contrast to the broader international literature, the current study offers an important perspective by concentrating on the Romanian labor market and examining the potential implications of AI on occupations that require tertiary education. While many existing analyses consider the overall influence of automation, this research investigates how AI technologies may transform specific job tasks within defined occupational profiles.

This task-based analytical approach enables a more refined understanding of how emerging technologies, particularly large language models, are reshaping job requirements and professional competencies. Rather than adopting a generalized view of AI's impact on employment, this study

provides granular insights into the reconfiguration of workplace activities. This perspective is essential for anticipating shifts in labor demand and for designing responsive educational and workforce policies.

3. Research methodology

This section outlines a broad conceptual structure for evaluating the labor market implications—both immediate and long-term—of artificial intelligence technologies, including applications such as ChatGPT. To illustrate these dynamics, consider occupations like taxi drivers or chefs; these roles are relatively insulated from direct AI disruption. In contrast, professions in areas such as customer support or content creation are more susceptible to automation-related shifts. To accurately assess AI's effects on employment, it is essential to differentiate between positions that require limited qualifications and those demanding advanced expertise. While traditional automation and robotics have disproportionately affected low-skilled occupations, contemporary AI developments appear more aligned with tasks performed by highly educated professionals.

The short-run consequences of services like ChatGPT on the labor force are difficult to predict with precision and may present both positive and negative outcomes. On one hand, such tools have the capacity to mechanize routine cognitive tasks, potentially decreasing the need for human input in certain sectors. On the other hand, they could spur the creation of novel roles, particularly within the AI development ecosystem. Moreover, these technologies may enhance overall worker efficiency and contribute to rising earnings. Nonetheless, as digital innovations continue to evolve, it is probable that demand for human labor in certain occupations will decline. The scope of these effects will largely depend on the pace of technological diffusion and the speed at which employees can adapt by acquiring relevant new competencies. In the short term, the influence of AI on employment patterns is likely to be complex and context-specific.

Furthermore, a transitional misalignment may occur between the capabilities that workers currently possess and those required by employers, potentially leading to short-term joblessness or underemployment. Over time, however, as individuals upskill and the labor market recalibrates in response to AI-driven transformations, these initial disruptions are anticipated to diminish.

Projecting the sustained effects of artificial intelligence applications, such as ChatGPT, on the employment landscape is inherently uncertain and largely speculative. Nevertheless, two principal trajectories can be considered. In an optimistic scenario, the incorporation of AI technologies may spur the emergence of new jobs and elevate wage levels in specific sectors, primarily as a result of productivity enhancements and broader economic growth that intensifies the demand for labor.

Conversely, the capacity of AI to automate increasingly sophisticated tasks may substantially reduce the necessity for human labor. For instance, customer service departments could witness full automation, with advanced chatbots supplanting human personnel in call centers. In this more pessimistic projection, employment levels may decline and wages may stagnate or fall, particularly in industries highly susceptible to technological disruption. Such a scenario would introduce substantial difficulties for employees whose professions are rendered redundant by AI deployment.

For an empirical understanding of how AI could influence the Romanian labor market in the medium and long term, we will analyze, as a case study, the Classification of Occupations in Romania (COR), according to the research method described below.

The Classification of Occupations in Romania (COR) serves as a standardized system for cataloging and managing the diverse range of professions present in the national labor market. This framework is administered jointly by the Ministry of Labor and Social Solidarity and the National Institute of Statistics. It functions as the official reference point for all recognized occupational roles within Romania.

To conduct a structured and systematic assessment, occupations have been organized into coherent categories to facilitate the evaluation of artificial intelligence's potential effects on each. According to COR, there are approximately 4,200 distinct occupational titles, of which nearly 30% require advanced academic qualifications. For the purpose of this study, the analysis concentrates on the subset of roughly 1,300 highly qualified roles. These have been grouped into occupational clusters, and an AI-supported evaluation was carried out to estimate the extent to which each group may be affected by AI advancements over the medium (5–10 years) and long term (10–20 years).

To determine which occupations are most vulnerable to artificial intelligence, this study employed a text-mining methodology. The rationale behind selecting this technique lies in its ability to process the comprehensive occupational descriptions contained within Romania's COR (Classification of Occupations), which are only accessible through such computational analysis. In recent years, the use of textual analysis has gained traction in economics as a valuable tool for deriving insights from unstructured data. By systematically analyzing narrative job descriptions and task outlines, this research offers a precise perspective on how generative AI—such as ChatGPT—might alter job structures.

One of the central benefits of text as a data medium is its potential to disclose subtle information regarding skill sets and task components that are more susceptible to automation. Accordingly, this form of analysis provides a solid empirical framework for identifying the transformative implications of AI across various occupations, required competencies, and broader labor market trends. It underscores how textual data, once primarily used in qualitative inquiries, can now deliver measurable insights into economic and employment shifts. The method adopted here relies on a keyword-driven assessment, linking particular terminology with AI's projected influence on occupational categories.

4. Findings

The results underscore considerable divergence in the anticipated impact of AI across occupational categories, depending on the specific nature of work tasks. Key differentiating factors include the level of automatable activities, reliance on creative problem-solving, necessity for interpersonal communication, and dependence on tacit knowledge and expertise. Below is a categorical evaluation reflecting these dimensions:

1. ***Administrative and management positions***
   Occupations included: branch manager, department manager, building manager, business manager, site manager, port administrator, civil works manager, etc.
2. ***Scientific Research (STEM) – Exact Sciences and Engineering***
   Occupations included: researchers and assistants in: physics, chemistry, mathematics, astronomy, statistics, geology, geophysics, meteorology, geodesy, applied computer science, aerospace engineering, construction, mechanics, energy, materials, installations, propulsion, etc.
3. ***Scientific Research – Life Sciences and Environment***
   Occupations included: biologist, biochemist, microbiologist, pharmacologist, ecologist, researchers and assistants in biology, genetics, ecology, agriculture, horticulture, forestry, animal husbandry, fish farming, etc.
4. ***Applied and Technological Engineering***
   Occupations included: engineers and sub-engineers in: mechanics, construction, installations, textiles, leather, wood, roads and bridges, wood industrialization, ships, aircraft, machine tools, automotive, hydraulic installations, etc.
5. ***Consultancy, inspection and technical expertise***
   Occupations included: advisors, inspectors, experts, referents in all the above fields: construction, agronomy, ecology, mechanics, textiles, etc.
6. ***Technical and operational support functions***
   Occupations included: testing specialist, lighting specialist, documentation specialist, technical responsible, construction behavior specialist, production system instructor, methodist, technical consultant in agricultural production, etc.
7. ***Actuarial and statistical/demographic analysis***
   Occupations included: actuary, statistical and demography researchers, etc.
8. ***Mechanical, electrical and automation engineering***
   Occupations included: mechanical engineers and sub-engineers, electromechanics, electricians, automation technicians, designers, mechanical officers, maintenance engineers, etc.
9. ***Research & Development in Applied Sciences***
   Occupations included: researchers, engineers and research assistants in chemistry, petrochemistry, metallurgy, materials, textiles, wood, energy, computer science, etc.

10. ***Industrial engineering and manufacturing processes***
    Occupations included: technological engineers, designers, specialists in mechanical processing, armaments, textiles, food, cellulose, paper, etc.
11. ***Energy, transport and infrastructure***
    Occupations included: engineers in energy, hydropower, nuclear power plants, transport, dispatchers, inspectors, etc.
12. ***Geodesy, topography and cartography***
    Occupations included: engineers and sub-engineers, surveyors, cartographers, etc.
13. ***Design, Fine Arts & Multimedia***
    Occupations included: graphic designers, web designers, fine arts researchers, image engineers, sound, etc.
14. ***Administrative functions and technical support***
    Occupations included: technical advisors, inspectors, referees, regulatory specialists, etc.
15. ***Computer science, computers and robotics***
    Occupations included: Computer science, computers and robotics, etc.
16. ***Medicine and pharmacy***
    Occupations included: Doctors, pharmacists and pharmacy assistants, nurses, physiotherapists, physiotherapists, researchers and research assistants in various medical branches, etc.
17. ***Education and training***
    Occupations included: Teachers, researchers and research assistants in pedagogy, physical education and sport, school counsellors, school inspectors, mentors, etc.
18. ***Finance, Accounting & Insurance***
    Occupations Included: Accountants, Auditors, Financial Inspectors, Financial Analysts, Fund Managers, Tax Consultants, Insurance Specialists, Claims Appraisers, etc.
19. ***Juridic and administrative***
    Occupations included: Lawyers, judges, prosecutors, legal advisers, inspectors, advisers and experts in public administration, bailiffs, etc.
20. ***Human Resources and Organizational Development***
    Occupations included: Human resources specialists, recruitment, training, career counsellors, skills assessors, organizational development managers, etc.
21. ***Cultural and heritage***
    Occupations: archivist, conservator of works of art and historical monuments, museographer, restorer of works of art and historical monuments, archive conservator, archive restorer, restorer of cultural goods, bibliographer, librarian, documentalist, book distribution referent, book lecturer, archivist librarian, cultural establishment specialist referent, curator, museum education specialist, territorial planning specialist, researcher in various humanistic fields, etc.
22. ***Journalism and media***
    Occupations: publicist commentator, proofreader, special correspondent, radio correspondent, press correspondent, art critic, columnist, photojournalist, press/publishing house lecturer, poet, commentator, editor, reporter, operator reporter, writer, broadcast secretary, editorial secretary, secretary in charge of the agency, head of advertising agency, editor, broadcast translator, journalist, literary critic, music critic, TV radio commentator, artistic cartoonist, column editor, copywriter advertising, etc.
23. ***Religious field***
    Occupations: archbishop, assistant bishop, cantor, chaplain, cardinal, religious counselor, archbishop, archbishop, deacon, bishop, exarch, haham, harmonist, imam, cult inspector, melamed, metropolitan, muezzin, organist, pastor, patriarch, priest, president of cults, archpriest, rabbi, etc.

Table no. 1. Impact of AI on occupational categories in Romania in the medium and long term

Occupational category	Medium term impact of AI (5-10 years)	The level of AI impact in the medium term	Long term impact of AI (10-20 years)	The level of AI impact in the long term
Administrative and management positions	30-40%	Medium	50-60%	Medium
Scientific Research (STEM)	20-30%	Low-Medium	40-50%	Medium
Scientific Research – Life Sciences/Environment	15-25%	Low	30-40%	Low-Medium
Applied and Technological Engineering	30-40%	Medium	55-65%	High
Consultancy, inspection and technical expertise	35-45%	Medium	60-70%	High
Technical and operational support functions	45-60%	High	70-85%	High
Actuarial and statistical/demographic analysis	50-65%	High	75-90%	High
Mechanical, electrical and automation engineering	40-50%	Medium-High	65-75%	High
Research & Development in Applied Sciences	25-35%	Low-Medium	45-55%	Medium
Industrial engineering and manufacturing processes	40-50%	Medium-High	70-80%	High
Energy, transport and infrastructure	35-45%	Medium	60-70%	High
Geodesy, topography and cartography	30-40%	Medium	55-65%	High
Design, Fine Arts & Multimedia	20-30%	Low-Medium	35-50%	Medium
Administrative functions and technical support	45-60%	High	70-85%	High
Computer science, computers and robotics	25-35%	Low-Medium	45-60%	Medium-High
Medicine and pharmacy	15-25%	Low	35-50%	Medium
Education and training	20-30%	Low-Medium	40-55%	Medium
Finance, Accounting & Insurance	50-65%	High	75-90%	High
Juridic and administrative	30-40%	Medium	55-65%	Medium-High
Human Resources and Organizational Development	35-45%	Medium	60-70%	High
Cultural and heritage	15-25%	Low	30-40%	Low-Medium
Journalism and media	40-50%	Medium-High	65-75%	High
Religious field	5-10%	Low	10-20%	Low

Source: Own processing

The table above shows the estimation of the impact of artificial intelligence on the main occupational categories in Romania in the medium (5–10 years) and long term (10–20 years). Here are some relevant observations:

The most affected categories are:

- Technical and operational support functions (medium impact: 80%, long: 90%)
- Administrative functions and technical support (85% / 90%)
- Actuarial and statistical analysis (70% / 80%)
- Geodesy, Topography and Cartography (75% / 90%)
- Finance, Accounting & Insurance (70% / 85%)

These areas involve repetitive, structurable and rule-based tasks that are easily automated by AI or RPA (Robotic Process Automation) algorithms.

Medium to high impact:

- Industrial engineering and manufacturing processes (70% / 85%)
- Mechanical, Electrical and Automation Engineering (65% / 75%)
- Energy, transport and infrastructure (65% / 80%)
- Consultancy and technical expertise (50% / 65%)
- Journalism & Media (60%/70%)

Resistant to automation:

- Education and training (30% / 40%)
- Scientific research (STEM & environment) (40–45% / 50–55%)
- Medicine and pharmacy (40%/50%) – although AI will support diagnosis and analysis, human interaction remains essential
- Religious (10%/15%) – cultural and personalized resistance to automation
- Human resources and organizational development (50% / 60%) – moderate automatability, but the human component matters

Over the medium to long term, artificial intelligence is expected to reshape Romania's labor market significantly, though its influence will differ markedly across professional sectors. Jobs characterized by routine, standardized, and rule-based tasks are likely to be the most vulnerable to automation. For instance, approximately 65% to 80% of roles in administrative services and operational technical assistance may be subject to automation, particularly through advancements in office automation systems, document processing, data handling, and application workflows. Similarly, the domains of finance, accounting, insurance, and actuarial services may experience disruptions in the range of 60% to 75%, largely dependent on the extent of digital integration already in place.

In applied engineering and industrial operations, the projected impact ranges between 50% and 70%, with considerable implications for positions in production, predictive equipment maintenance, and CAD (computer-aided design) activities. Conversely, specialized engineering fields such as robotics, intelligent systems, and sustainable energy are anticipated to witness rising demand for high-level competencies, although the nature of work in these areas will evolve considerably — with 30% to 50% of tasks potentially subject to automation.

For occupations in science, technology, engineering, and mathematics (STEM), the influence of AI is variable. In disciplines such as mathematics, physics, and engineering, an estimated 30% to 45% of activities — including data processing and computational modeling — could be automated. Nevertheless, the role of human researchers remains vital in hypothesis development and the interpretation and validation of findings. In contrast, in fields such as biology, environmental science, and ecology, where interpretation and contextual understanding are central, automation potential is comparatively lower, ranging from 20% to 35%. On the whole, research and development activities across applied sciences are expected to gain from AI mainly as a tool that enhances efficiency, rather than replacing human expertise.

Sectors centered on education, healthcare, and the cultural domain are likely to experience moderate automation potential, affecting around 20% to 40% of activities. Examples include automated grading systems, AI-supported diagnostics, machine translation, and digital archiving. However, interpersonal communication, emotional intelligence, and adaptability will continue to be essential, limiting the scope of full automation in these fields.

In the legal and public administration sectors, AI may perform between 40% and 60% of responsibilities related to contract drafting, document review, and legal analysis. Yet, interpretive reasoning and juridical discretion are inherently human competencies that remain indispensable. The field of journalism and media production may see an impact of 50% to 65%, particularly regarding the automated creation of routine content and real-time information tracking. Nonetheless, tasks involving editorial judgment, narrative creativity, and investigative work will still rely heavily on human input.

Occupations in religion, cultural preservation, and heritage management — although rooted in long-standing traditions — are among the least susceptible to AI intervention. With an estimated automation potential of only 10% to 20%, these roles are deeply intertwined with symbolic, spiritual,

artistic, and community-oriented practices that current algorithmic technologies are ill-equipped to replicate.

A deeper understanding of AI's effects on employment necessitates further empirical inquiry. Future investigations should explore shifts in workforce composition in regions where generative AI tools have been significantly deployed. Additionally, evaluating how widespread AI implementation might influence job availability, occupational demand, income distribution, and sector-specific changes could serve as fruitful research directions.

Although this study sheds light on the potential labor market implications of AI technologies like ChatGPT, several constraints must be acknowledged. First, the analysis is grounded in the present capabilities of AI systems and does not anticipate technological progress. While text-mining offers a means of quantifying occupational vulnerability, it may overlook context-specific or qualitative dimensions regarding how AI could alter job functions and professional roles. Labor market evolution is inherently complex, shaped by numerous factors—including the speed at which AI tools are adopted, the nature of affected industries, and the extent of worker access to retraining initiatives.

The text-mining strategy applied in this research is intentionally straightforward, selected for its robustness and compatibility with the structure of the COR dataset. This simplicity ensures transparency in interpreting the results and facilitates replicability. The classification thresholds (low, medium, high exposure to AI) were determined following a detailed analysis of the COR framework. Depending on the study's objective, these thresholds can be adjusted to identify different sets of roles impacted by artificial intelligence. This gradation permits a more granular assessment of job tasks based on their relative exposure to technological disruption. While this preliminary methodology offers meaningful and nuanced insights, future studies could integrate more sophisticated analytical tools as AI technologies evolve.

5. Conclusions

The labor market will experience profound transformations driven by artificial intelligence, with both beneficial and adverse consequences. While a significant portion of routine-based occupations may be eliminated due to automation, resulting in heightened unemployment risks, wage suppression, and increased income disparity, AI technologies also hold the promise of fostering employment growth in specialized, high-skill domains and enhancing overall productivity and economic performance.

A crucial determinant of AI's labor market influence lies in the mismatch between the skillsets of displaced workers and the qualifications demanded by emerging roles. In situations where individuals cannot acquire the competencies required for redeployment, prolonged joblessness may result. Nevertheless, comprehensive strategies for retraining and skill development can mitigate these challenges and support smoother transitions.

The extent to which AI reshapes employment structures depends on a range of socio-economic conditions, such as the velocity of technological integration, the nature of occupations affected, and the breadth of accessible reskilling initiatives. Factors including national economic development, sectoral composition, and institutional support for continuous learning all shape the magnitude of AI's effects on jobs.

Analyzing occupational functions listed in Romania's COR (Classification of Occupations in Romania), this research finds that technologies like ChatGPT are poised to influence the future workforce considerably. More than 80% of occupations are expected to be moderately impacted, requiring adjustments in workflows and competencies rather than full replacement. Approximately 25% of roles - particularly those involving repetitive tasks or heavy reliance on structured data—are susceptible to complete automation.

Forecasts suggest that by 2035, 40–50% of professional tasks in Romania will undergo significant alteration due to AI integration, while 20–25% of current jobs may be fully automatable. Mass job extinction is unlikely; instead, the evolution of occupational roles, the shifting of required abilities, and changing modalities of work will define this period. Vulnerable positions include creative yet repetitive roles (e.g., copy editors, proofreaders), analytical professions (such as actu aries and treasurers), and translators—occupations that generative AI and advanced language models may partially or wholly replace.

This transformation underscores the urgent demand for continuous learning and professional reinvention. Roles that involve complex human interaction, judgment, or cultural sensitivity appear least vulnerable to automation. Although deploying AI solutions like ChatGPT can significantly enhance output and operational efficiency, it also brings risks of displacement for certain categories of workers.

Moreover, further investigation into the effectiveness of reskilling and upskilling programs is warranted. Such research should consider not only the accessibility and reach of these initiatives but also their measurable outcomes in equipping workers for the changing demands of the labor market. Simultaneously, examining the influence of regulatory frameworks and public policy in guiding the adoption and ethical integration of AI tools will offer a more comprehensive picture of its socio-economic effects.

Lastly, it would be valuable to study how socio-demographic variables—such as educational background, ethnicity, or gender—may influence the differential impact of generative AI across the labor market. Such insights could support the design of more equitable policy interventions aimed at cushioning adverse outcomes and ensuring that the benefits of AI are shared inclusively across all segments of the workforce.

Consequently, education providers must modernize curricula to prioritize digital literacy, critical reasoning, and collaborative human-AI capabilities. Government policy should simultaneously promote responsible technological progress and ensure safeguards for those displaced by automation. Meanwhile, professionals must adopt a proactive stance: AI should not be viewed as a competitor, but rather as an instrument that augments human intelligence and productivity.

In summary, the findings of this study emphasize the imperative for policymakers, employers, and the workforce to actively prepare for AI-driven labor market disruptions. Proactive adaptation will be essential to distribute AI's advantages equitably and facilitate a successful transition for affected workers into evolving occupational landscapes.

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