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Article

Artificial Intelligence and Labour Market Transformation: A Comparative Analysis of Occupation Exposure to AI in Selected Economic Sectors

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Abstract: Artificial Intelligence (AI) is transforming labour markets by redefining work, influencing employment, and shaping skill sets in the modern economy. While AI has been a major driver of productivity and innovation, its impact on jobs has been contradictory and inconsistent across occupations and economic sectors. This study aims to assess the impact of AI on employment by comparing the exposure of occupations to AI across six economic sectors, including manufacturing, information technology, banking and financial services, healthcare, education, and retail. The study employs a descriptive research design by analysing secondary data on occupational exposure to AI from international organizations, including the World Economic Forum, the International Labour Organization, the Organisation for Economic Co-operation and Development, the World Bank, the International Monetary Fund, and the Stanford AI Index. The study uses descriptive statistics to present comparative information on employment trends, including tables, percentages, bar charts, pie charts, and graphical trends to examine the impact of AI on employment and skills. The study will classify occupations according to their exposure to AI as high, moderate, and low to compare employment opportunities and skills in different economic sectors. The study expects to reveal that AI does not necessarily eliminate jobs but transforms occupations by automating specific processes while creating new opportunities that require analytical, creative, technological, and interpersonal skills. The findings will contribute to the body of research on the economics of AI while providing insights for students, educators, policymakers, and employers in the context of an increasingly automated economy.
Keywords: Artificial Intelligence; Labour Market; Employment; Occupational AI Exposure; Workforce Transformation; Economic Sectors; Automation; Labour Economics; Secondary Data Analysis.

1. INTRODUCTION

Artificial Intelligence (AI) is no longer a niche technology but a general-purpose technology (GPT) that has the potential to transform economies, industries, and labour markets. Like electricity or information technology, AI can be applied in diverse economic sectors and has the potential to facilitate continuous innovations through automation, prediction, and decision-making (Acemoglu & Restrepo, 2019; Agrawal, Gans, & Goldfarb, 2019). Advances in machine learning, natural language processing, robotics, computer vision, and generative artificial intelligence have enabled firms to benefit from automation and increased productivity, thus fueling the digital transformation of economies (Maslej et al., 2025). The growing adoption of artificial intelligence in manufacturing, banking and financial services, healthcare, education, retail, and information technology has affected production processes, organizational structures, and consequently, the demand for labour (OECD, 2025; World Economic Forum [WEF], 2025). Technological revolutions have historically altered labour markets by raising overall productivity levels while also displacing workers in certain sectors. While the first industrial revolution mechanized production processes and the second one digitized information, the third revolution is manifested by AI's ability to undertake activities that require prediction, reasoning, and decision-making (Agrawal et al., 2019). Since predictive analytics plays a critical

role in economic decision-making, one expects that changes in the labour market will be influenced by both the production function and the employment effects of AI (Agrawal et al., 2019).

The relationship between labour and artificial intelligence is therefore complex and nuanced and goes beyond simply postulating that AI destroys or creates jobs. Contemporary labour economics is premised on the assumption that occupations can be disaggregated into discrete tasks that can be automated or performed by humans (Acemoglu & Restrepo, 2019). For instance, while robotics and other automated technologies can perform standardized tasks, managerial activities, negotiations, strategic decision-making, and other uniquely human skills are less likely to be automated (Acemoglu & Restrepo, 2019). While the adoption of AI in the workplace has a displacement effect on employment, the same technology has an employment creation effect as it facilitates the creation of new products and services that require complementary skills (Acemoglu & Restrepo, 2019). In addition to traditional economic theories, one can therefore argue that AI is a productivity-enhancing innovation that can create jobs if the right skills are invested in.

The economic impact of AI on employment is not uniform across occupations because of differences in the extent to which individual tasks can be automated. Occupations that comprise more standardized tasks such as administrative work, manufacturing, bookkeeping, and other predictable activities are more susceptible to automation than those that require creative, managerial, communicative, and ethical skills (Agrawal et al., 2019). Similarly, the impact of AI on employment varies between industries because of differences in their reliance on technology as well as their readiness to adopt AI (OECD, 2025; WEF, 2025). For instance, manufacturing firms have embraced industrial robots and AI-enabled process control systems to ensure higher productivity while reducing costs. Banking and financial services have adopted AI-enabled technologies in credit evaluation, fraud detection, customer relationship management, and algorithmic trading to improve efficiency and decision-making (OECD, 2025; WEF, 2025). In healthcare, AI is used in diagnosis, medical imaging, and treatment while medical professionals continue to play a critical role in management and oversight (WEF, 2025). Similarly, education, retail, and information technology sectors are adopting AI in teaching and learning, recommendation systems, inventory management, and customer service among other applications (WEF, 2025). Information technology is both a producer and a consumer of AI and therefore creates employment for developers and engineers while also displacing workers in some areas (WEF, 2025). These differences between and within industries suggest that the impact of AI on employment is not uniform and varies based on several factors.

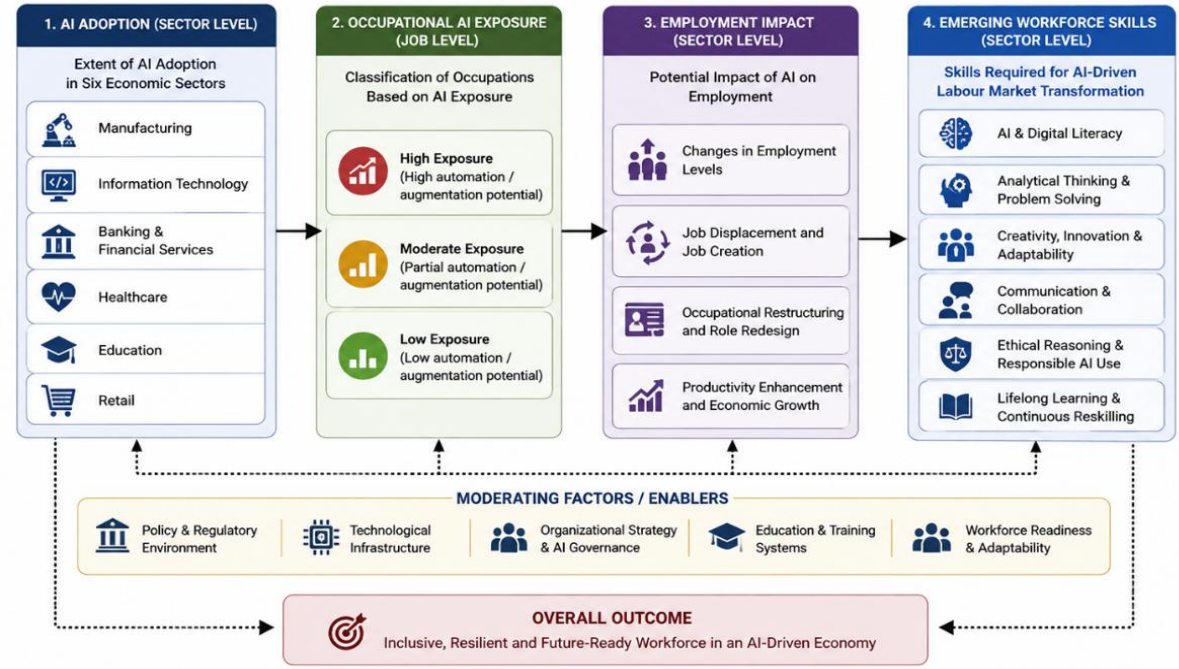
Advancements in AI have also changed the skill composition of jobs, and therefore the skill needs in the modern economy. While technical skills were sufficient in the past, modern firms require analytical, digital, communication, and critical thinking skills among employees (Agrawal et al., 2019). AI is therefore a complement to human skills as it takes over standardized tasks while leaving more complex activities that require contextual awareness and judgment to humans (Agrawal et al., 2019). Investments in education and skills development are therefore essential for ensuring that individuals are able to meet the changing demands of the labour market (OECD, 2025). The changing demands of the modern economy have necessitated the need to invest in quality education and skills development to ensure that individuals are able to meet the changing demands of the labour market while also being competitive (OECD, 2025).

While there is a growing body of literature on AI and the future of work, most of the existing studies focus on either the potential for automation or the impact on specific occupations. There is a need for more comparative studies that can demonstrate the differences in the exposure of occupations to AI as well as the differences in the impact on employment across economic sectors. Such studies would be useful in providing insights into the likely changes in employment patterns and skill needs in different industries. This study aims to contribute to the existing body of knowledge on AI's economic impact by comparing and contrasting the effects in six major economic sectors, namely manufacturing, banking and financial services, healthcare, education, retail, and information technology. The study will utilize secondary data from various sources to examine the extent to which occupations in each sector are exposed to AI. The findings will be presented using descriptive statistics, comparative tables, percentage analysis, bar charts, pie charts, and graphical analysis to demonstrate the differences between and within the six sectors. It is expected that the findings will provide a deeper understanding of the likely impact of AI on employment and skills in different

economic sectors, and therefore support informed decision-making by educators, students, employers, and policymakers. The Conceptual Framework (Figure1) shows how AI adoption influences occupational exposure, employment outcomes, and emerging workforce skills across six selected economic sectors.

Conceptual Framework

Figure 1: AI Adoption and Labour Market Transformation across selected Economic Sectors



Source: Developed by Author

2. LITERATURE REVIEW

2.1 Evolution of Artificial Intelligence in the Labour Market

Artificial intelligence (AI) research has progressed from a narrow to a general-purpose technology by transforming economic production, organizational activities, and the labor market. Previously, major technological advancements primarily automated manual tasks, but current innovations and developments in machine learning, deep learning, natural language processing, and generative AI appear to empower cognitive, analytical, and creative occupations (Brynjolfsson & McAfee, 2014; Autor, 2015). As a result, there has been a paradigm shift in the analysis of AI's impact on employment from substituting jobs to transforming tasks.

Researchers have noted that AI should be considered a task-based technology because occupations comprise various complementary activities, only a subset of which can be automated (Autor, Levy, & Murnane, 2003) . This school of thought has since dominated scholarly debates about AI's impact on the labor market, with complementary theories postulating that AI primarily transforms rather than eliminates employment.

The rise of generative AI has been associated with growing concerns about automation of cognitive tasks previously thought to be relatively safe from AI disruption. Unlike the prior wave of automation that largely focused on physical activities, generative AI enables the creation of text, code, documents, customer service responses, and knowledge (OpenAI, 2023). As a result, exposure to AI has become a general concern and has extended to managerial, professional, and technical occupations.

2.2 Theoretical Perspectives

Researchers have theorized AI's impact on employment from several perspectives. First, the skill-biased technological change (SBTC) hypothesis postulates that technology favors skilled workers over their unskilled counterparts (Acemoglu, 2002) . Thus, AI adoption in the workplace could increase the demand for high-skilled workers while lowering the requirement for individuals with lesser competencies. An extension of the SBTC is the routine-based technological change (RBTC) hypothesis, which states that occupations requiring routine cognitive and manual tasks are the ones that technology makes the most vulnerable to automation (Autor et al., 2003) . This theory helps explain the polarization of the labor market as firms favor high-skilled workers and low-skilled occupations that RBTC makes inaccessible to automation. However, Acemoglu and Restrepo (2018, 2022) propose a task displacement-task reinstatement framework wherein they argue that rather than creating or destroying jobs, AI primarily displaces some tasks while reinstating others, with the overall effect that technology makes human labor more transformative. In a similar vein, the OECD (2023) contends that AI affects employment quality, organizational practices, and employee agency, arguing that its impact extends beyond just jobs gained and jobs lost.

2.3 Occupational AI Exposure Concept

Occupational AI exposure has become a popular metric for analyzing the impact of AI on employment. Unlike prior research on automation that classified occupations as either automatable or non-automatable, AI exposure focuses on how AI abilities overlap with the activities that characterize each occupation. Felten, Raj, and Seamans (2021) were the first researchers to operationalize this notion by constructing an AI Occupational Exposure (AIOE) metric based on occupations' task descriptions in the ONET database. According to their results, AI exposure varies significantly across occupations, with software development, financial analysis, legal, and administrative occupations being among the top occupations that could benefit from AI.

Eloundou et al. (2023) conducted a similar study and found that generative AI has the potential to disrupt approximately 80 percent of the workforce, with 19 percent exposed to more than 50 percent AI-assisted activities. Occupations that involve writing, analysis, programming, and communication are expected to experience the highest level of disruption. Webb (2020) also examined occupational exposure to AI but used a patent-based approach to identify AI-related technological innovations and matched technologies with occupations. He found that AI exposure varied significantly across sectors, with the information technology industry being the most exposed to AI. The study further revealed that, unlike prior waves of automation, AI primarily targets cognitive tasks over manual activities.

2.4 Sectoral Differences

AI exposure varies significantly across economic sectors because different industries pursue technology adoption differently. The manufacturing sector is the most digitized and has benefited immensely from industrial robots, computer vision, and other AI technologies (International Federation of Robotics, 2024), thereby automating many manual and physical tasks while leaving cognitive activities for humans.

The finance sector has witnessed a rapid rise in AI adoption that has transformed financial transactions, customer relations, and operations, particularly in fraud detection, algorithmic trading, robo-advisory, credit risk assessment, and management (OECD, 2023) . Financial institutions have increasingly used AI to automate processes such as contract writing and customer communication, thereby disrupting managerial occupations.

Healthcare has witnessed the rise of clinical decision-support systems that employ AI to enhance patient care through improved diagnostic accuracy and treatment recommendation while also automating administrative tasks such as scheduling, billing, and record management (WHO, 2021) . Education has also adopted AI to facilitate learning while assisting teachers in grading, lesson planning, and offering recommendations to students (UNESCO, 2023) .

Meanwhile, the information technology sector is characterized by high exposure to AI in software development, coding, and programming activities. By contrast, relatively few AI applications are used in sectors that require extensive human interaction, such as the hospitality and social work sectors (ILO, 2025).

2.5 Employment Impact of Artificial Intelligence

Researchers have generated contradictory conclusions regarding AI's impact on employment. Earlier studies predicted that AI would displace a significant proportion of the global workforce because it could automate routine cognitive and manual tasks. For example, Frey and Osborne (2017) developed an occupational automation probability metric and concluded that 47 percent of U.S. occupations were at risk of computerization. These findings fueled the narrative surrounding technological unemployment and automation of entire occupations.

However, more recent studies have questioned these conclusions by highlighting the differences in tasks that comprise occupations. For example, Arntz, Gregory, and Zierahn's (2016) assessment of occupational automation potential identified only a relatively small number of occupations that are highly susceptible to full automation. The International Labour Organization (2025) further observes that rather than eliminating employment, AI primarily transforms tasks, with each occupation being affected differently.

The IMF Working Party on the Future of Work (2024) estimates that approximately 40 percent of global employment is exposed to AI, with developed countries being the most affected due to their reliance on knowledge-intensive occupations. By contrast, the World Economic Forum (2025) predicts that while AI adoption will decrease the demand for certain occupations, it will increase the need for other specialized occupations, with the most affected categories being general workers, clerical occupations, and managers.

2.6 Human Abilities and Skills in Demand

As AI automates routine tasks, there has been a surge in demand for complementary human skills, particularly analytical competencies, AI literacy, and managerial abilities. For example, the World Economic Forum (2025) has identified analytical thinking, AI proficiency, and technological competencies as the most in-demand skills. Similarly, the OECD (2023) highlights digital literacy, collaborative problem-solving, and adaptability as critical skills for working with AI.

Furthermore, UNESCO (2023) emphasizes responsible AI usage, ethical decision-making, and critical thinking as some of the most crucial competencies for interacting with AI in education. Generative AI requires prompt engineering, supervision, verification, and human judgment in areas where these technologies offer limited capabilities, thus creating demand for human abilities such as creativity, adaptability, and decision-making in lieu of repetitive processing (OpenAI, 2023) . Consequently, sustaining a competitive workforce in the AI economy requires continuous learning, which has become a primary policy consideration in most developed and developing countries.

Overall, the reviewed literature offers conflicting evidence on AI's impact on employment, with some studies suggesting that it primarily displaces workers while others argue that it transforms tasks. Automation of routine activities has increased the demand for complementary skills, particularly analytical competencies and managerial abilities. Several studies emphasize the importance of lifelong learning and reskilling for effective adaptation to AI technologies while noting significant differences in occupational exposure to AI. Most of these studies examine either individual occupations or entire sectors but rarely compare exposure to AI across multiple occupations within different economic spheres, and none highlight the differences in exposure across several occupations within one economic sector. These gaps in the literature justify the current study, which compares AI exposure across multiple occupations within the selected economic sectors.

3. FINDINGS AND ANALYSIS

3.1 Sector-wise AI Adoption

Artificial Intelligence (AI) has become a critical technology to be adopted and implemented in diverse fields to achieve operational excellence, digitize monotonous tasks, make decisions more efficiently and accurately, and develop disruptive products and services. While the adoption and implementation of AI have been on the rise worldwide, the technology has been adopted and implemented at varying rates in different economic sectors. The variation in the level of AI adoption and implementation in different economic sectors can be explained by the variation in the level of technology adoption, digital infrastructure, policy, investment capacity, and skill set in each

industry (OECD, 2023; World Economic Forum [WEF], 2025). Some fields have adopted and implemented AI at a higher rate than others. For example, the information technology sector has adopted and implemented AI at a higher rate compared to the education and retail sectors; meanwhile, other fields such as the finance sector have adopted and implemented AI at an extremely high rate. Therefore, determining the level of AI adoption in different economic sectors is critical to understanding the extent to which different occupations are exposed to AI and its impact on employment.

To begin with, the information technology (IT) sector is the field that has adopted and implemented AI at the highest level because products and services in the IT sector, such as software development, cybersecurity, cloud computing, robotics, system monitoring, and application programming, have benefited from the use of generative AI to enhance performance efficiency and accuracy while eliminating human errors. Generative AI has been used in computer-generated code, testing, documentation, and support to enable developers and programmers create disruptive software solutions in place of monotonous coding activities (Stanford University, 2025; WEF, 2025). IT has high digital infrastructure and attracts highly-skilled and specialized professionals, making it easier for the industry to adopt and implement AI.

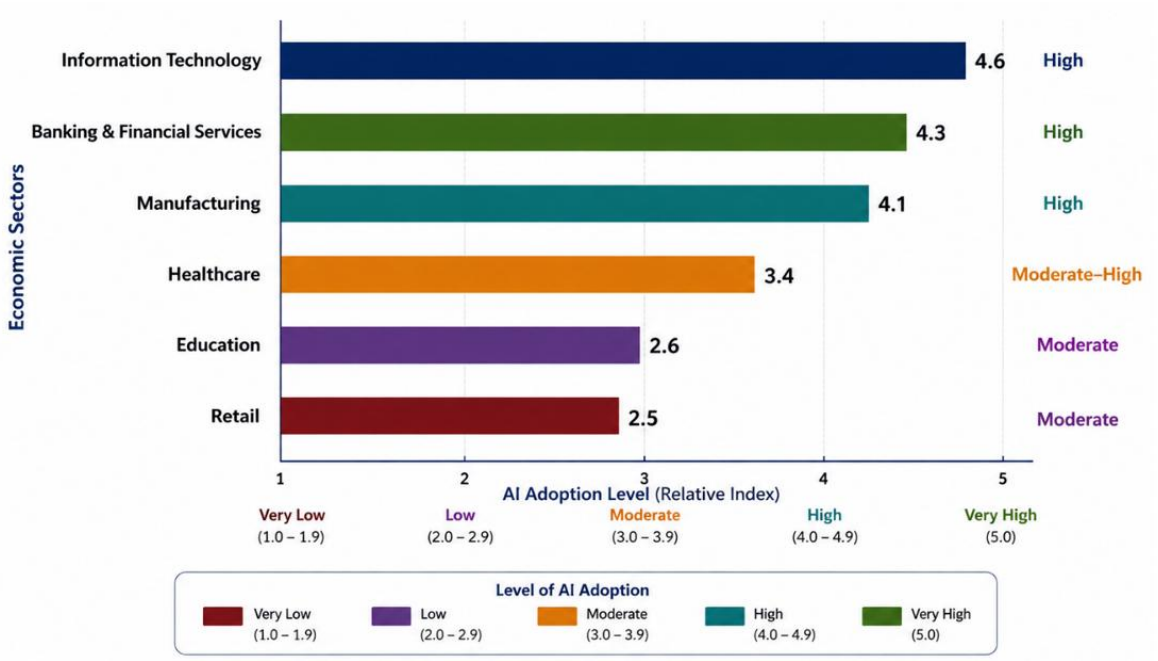
In addition, the finance sector has adopted and implemented AI at an extremely high level because most of its operations have been automated using the technology to facilitate faster and more accurate transaction processing, detect and prevent fraudulent activities, and strengthen customer relationship management. Fraudulent transaction detection, credit risk assessment, algorithmic trading, regulatory compliance, anti-money laundering, customer relationship management, and financial planning and control are some of the finance-related activities that have been automated using AI (OECD, 2023; International Monetary Fund [IMF], 2024). Generative AI has been used to prepare financial reports, communicate with customers, and provide virtual assistance to enhance speed and accuracy in financial transaction processing. As a result, the finance sector has leveraged on AI to improve its performance while also meeting the rising demand for higher-quality and faster customer service.

The third economic sector that has adopted and implemented AI at a high level is the manufacturing sector. The sector has been using AI to improve production efficiency while also reducing equipment failure, energy use, logistics costs, and operational delays. For example, manufacturing organizations have been using robotics, video imagery, digital twin technology, and predictive analytics to make their production processes smart while also avoiding damage to their machinery and equipment (International Federation of Robotics [IFR], 2024; Stanford University, 2025). The digitization of the manufacturing process has occurred at an unprecedented pace thanks to the introduction of AI in the industry, thereby accelerating the development of the Fourth Industrial Revolution. Interestingly, the healthcare sector has been adopting and implementing AI at a moderate level. Healthcare workers have been using AI in screening, diagnosing, monitoring, managing, and predicting the progression of diseases as well as analyzing and organizing patient data to enhance treatment decision-making and patient management. For example, AI has been used in medical imaging analysis and virtual health assistance to improve healthcare delivery while also considering ethical and legal issues in health data usage (World Health Organization [WHO], 2021; Stanford University, 2025). Most healthcare jobs require human skills to provide high-quality healthcare services; therefore, healthcare organizations only use AI as a complement to improve existing services.

The education sector has also been adopting and implementing AI at a moderate level after its heavy adoption in the IT sector. Generative AI has enabled educational institutions to provide enhanced services while also developing disruptive learning concepts, such as automated assessments, tutoring, and recommendations, to facilitate learning. For example, educational institutions have been using AI to grade assignments, give feedback to students, and recommend appropriate learning materials depending on individual skills and performance to enhance learning (UNESCO, 2023; WEF, 2025). Teaching and learning activities require human skills to ensure that students learn to acquire quality knowledge and practical skills; therefore, the education sector only uses AI to improve its services. Another sector that has been adopting and implementing AI at a moderate level is the retail sector. Various retail organizations have been using AI in tracking customer data, managing inventory, making recommendations, determining demands, and setting prices to improve customer satisfaction while also increasing sales. For example,

retail organizations have been using AI in their e-commerce platforms to offer a delightful online shopping experience to customers while also improving their marketing and distribution strategies. Traditional retail organizations have been slow to adopt and implement AI due to a lack of the necessary digital infrastructure and investment; however, the situation is likely to change soon as more retail organizations are beginning to appreciate the need for digitizing their operations (McKinsey & Company, 2023; Stanford University, 2025). Therefore, based on the level of adoption and implementation of AI in different economic sectors, the IT, finance, and manufacturing sectors have been integrating the technology at a higher level compared to the healthcare, education, and retail sectors, which have only partially adopted AI. The Figure 2 compares the relative levels of AI adoption across six economic sectors during 2020–2026, highlighting differences in sectoral adoption intensity.

Figure 2: Sector-wise AI Adoption across Selected Economic Sectors



Source: Compiled from WEF (2025); Stanford AI Index (2025); McKinsey (2023); ILO (2025)

3.2 Classification of Occupational AI Exposure across Selected Economic Sectors

Occupational AI exposure may be described as the likelihood that the tasks performed by a particular job occupation may be automated, assisted, or performed by artificial intelligence technologies. Unlike previous research that focused on occupational automation at a whole job level, the current study examines tasks as units of analysis since AI tends to perform discrete activities rather than entire jobs (Autor et al., 2003; Felten et al., 2021). With the rise of generative AI, the definition of occupational exposure comprises the likelihood of implementing AI technologies to execute contents such as writings, coding, analyzing documents, and other intellectual tasks (Eloundou et al., 2023). Therefore, it becomes evident that occupations may be segmented into those with high, moderate, and low exposure to AI.

First, occupations with high exposure to artificial intelligence are those that comprise a substantial proportion of routine, cognitive, and interpersonal tasks that may be automated by AI technologies. For instance, in the information technology sector, occupations such as programmers, quality assure analysts, and technical support specialists have a high likelihood of being exposed to AI due to their increased reliance on generative AI tools. On the other hand, jobs in the banking and finance sector have also been identified as those with high exposure to AI. This

includes financial analysts, loan officers, compliance executives, customer service roles, and fraud analysts whose activities comprise automated data analysis, documentation, and communication processes (OECD, 2023; Stanford AI Index, 2025). Occupations in the manufacturing sector may also involve robotics and computer vision AI technologies to perform quality assurance, production, and monitoring tasks (Felten et al., 2021).

Second, moderate exposure occupations comprise roles that involve a combination of routine and non-routine work that can be augmented by AI. In healthcare, physicians, nurses, radiologists, pharmacists, and administrators may rely on AI technologies to carry out routine activities such as analyzing data, recognizing medical images, and documentation. However, they would be required to perform core skills and make decisions independently. Other healthcare roles such as surgeons and social workers are considered to have moderate exposure to AI since they can use robotic-assisted technologies to perform specific functions with minimal automation of their routine tasks (WHO, 2021; UNESCO, 2023). Similarly, the education sector comprises occupations such as teachers, lecturers, instructional designers, and counselors who may rely on AI technologies to improve the decision-making process, analyze and manage data, and monitor performance records. Nonetheless, they would be required to carry out their special skills and maintain direct interaction with learners (WEF, 2025). Professions such as retail managers and marketing analysts may also rely on AI technologies to improve some decision-making processes without automating their activities.

Finally, occupations in the third category of low exposure to AI comprise roles that involve non-routine, cognitive, and interpersonal activities that cannot be replaced or augmented by AI technologies. These include senior officials, managers, researchers, psychologists, surgeons, social workers, and customer relationship managers. Although AI may support these professions by providing recommendations and analyzing data, they would be required to perform independent activities such as managerial and interpersonal skills (WEF, 2025). Similarly, retail occupations that require direct interaction and selling of products to customers and patient care roles in healthcare cannot be automated by AI due to the high level of interaction and manual dexterity needed to perform them (WHO, 2021). However, it is noteworthy that most occupations in all economic sectors have been exposed to AI to varying levels. Information technology occupations and those in the finance sector seem to be the most exposed to AI, while those in healthcare, education, and retail industries tend to be moderately exposed. Finally, most occupations in the manufacturing and services sectors have a low likelihood of being exposed to AI technologies. The Table1 classifies occupations into high, moderate, and low AI exposure categories across the six selected economic sectors based on the nature of their tasks and potential for AI automation or augmentation and the figure 3 compares the relative levels of high, moderate, and low AI exposure across occupations in the six selected economic sectors.

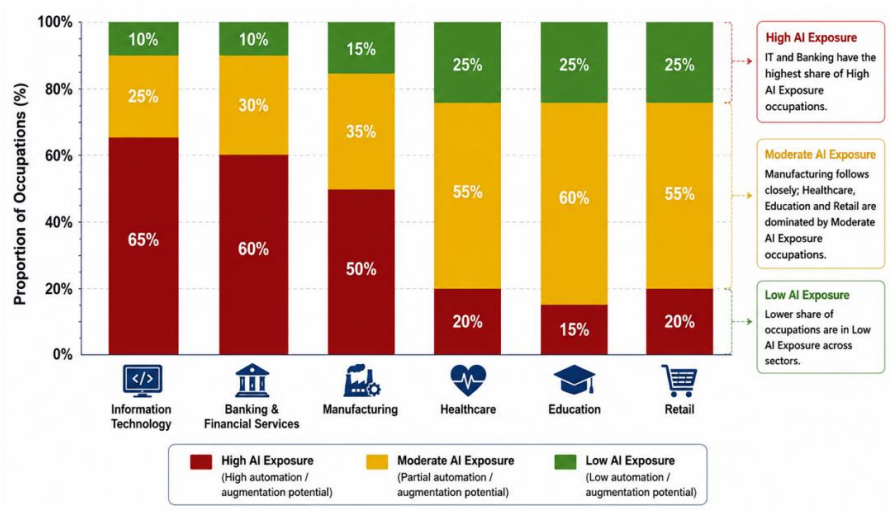
Table 1. Classification of Occupational AI Exposure Across Selected Economic Sectors

Sector	High AI Exposure	Moderate AI Exposure	Low AI Exposure
Manufacturing	Production planners, Quality inspectors, Process controllers	Maintenance engineers, Production supervisors	Plant managers, Industrial designers
Information Technology	Software developers, Programmers, QA analysts, Technical support	Systems analysts, Network administrators, Project managers	IT consultants, AI architects, Technology strategists
Banking & Financial Services	Financial analysts, Loan officers, Customer service executives, Compliance officers	Relationship managers, Investment advisors, Branch managers	Senior executives, Wealth managers, Strategic planners
Healthcare	Medical coders, Health information analysts	Physicians, Nurses, Radiologists, Pharmacists	Surgeons, Psychologists, Hospital directors

Education	Administrative assistants, Examination coordinators	Teachers, Lecturers, Instructional designers	Principals, Academic leaders, Education policymakers
Retail	Cashiers, Inventory controllers, Customer support executives	Store managers, Marketing executives, Merchandisers	Regional managers, Brand strategists, Customer experience directors

Source: *Compiled by the author based on OECD (2023), Felten et al. (2021), Eloundou et al. (2023), Stanford AI Index (2025), WEF (2025), and ILO (2025).*

Figure 3. Occupational AI Exposure Across Selected Economic Sectors



Source: Compiled by the author based on OECD (2023); Felten et al. (2021); Eloundou et al. (2023); Stanford AI Index (2025); WEF (2025); ILO (2025)

3.3 Employment Implications of Artificial Intelligence across Various Industries

The rising impact of the artificial intelligence (AI) technology has far-reaching implications for the labor market. Although previous studies explored the causes and effects of AI-driven employment disruptions, recent evidence indicates that AI technology replaces particular tasks with machines rather than entire occupations (Autor, 2015; Acemoglu & Restrepo, 2022). The changes in the nature of work are different, depending on the economic sector and the type of tasks performed. Therefore, employment and jobs in various industries may be considered as a complex phenomenon driven by technological progress.

First, it is noteworthy that the information technology sector is the most impacted by the rise of AI, as it replaces a wide range of repetitive tasks, including writing, testing, debugging, and documenting computer programs (Stanford AI Index, 2025). Although programming may see a reduction in demand, there is an increased need for AI developers, engineers, cloud architects, cybersecurity experts, and prompt designers (World Economic Forum [WEF], 2025). In addition, the banking and financial services sector witnesses significant AI-related employment changes, as financial institutions adopt technology to automate credit assessment, detect fraudulent transactions, prevent money laundering, and offer investment advice (OECD, 2023). At the same time, there is a growing need for financial analysts, bankers, fintech experts, cybersecurity analysts, and compliance managers (International Monetary Fund [IMF], 2024).

Furthermore, as organizations adopt AI to improve efficiency and reduce costs, the manufacturing industry undergoes significant workforce reductions. Robots, computer vision, and other AI technologies enable companies to automate numerous production processes, eliminating the need for humans in many routine areas (International

Federation of Robotics, 2024). Nonetheless, there is a growing need for automation and robotics experts, computer vision specialists, and industrial analysts. Similarly to manufacturing, healthcare professionals face employment disruptions caused by the introduction of AI technologies. Although robots and computers can perform many repetitive and routine tasks, healthcare workers remain in demand due to the complexity of the medical profession and the need for human care (World Health Organization [WHO], 2021). Finally, as schools and universities integrate AI into instruction and administration, teaching becomes more efficient and personalized. However, the fundamental nature of the teaching process remains the same, which means that educators will continue to be in demand, despite technological innovations and disruptions (UNESCO, 2023). Lastly, in the retail industry, AI helps organizations to optimize operations and provide customers with a better experience, eliminating the need for humans in many routine areas. Nonetheless, e-commerce and traditional retail stores need experts to manage their operations and engage in marketing and sales activities (McKinsey & Company, 2023).

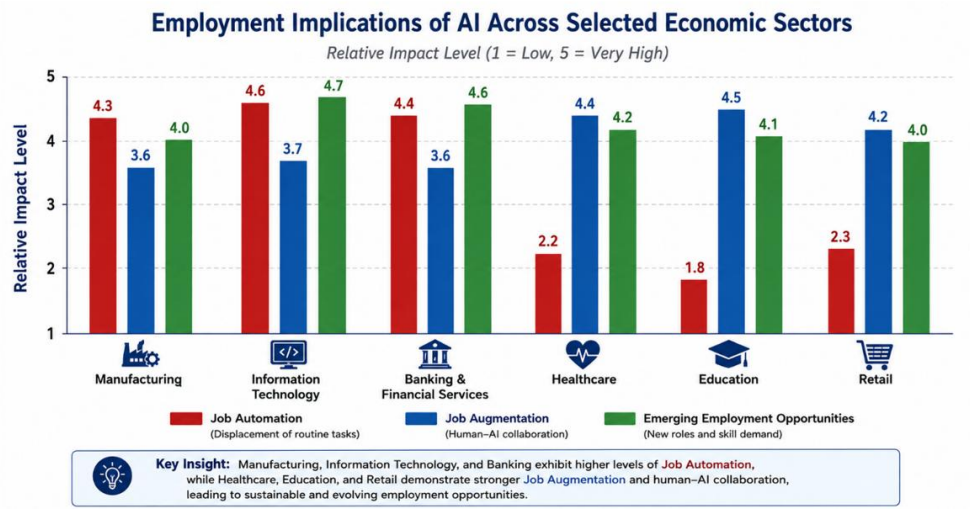
Overall, the analysis reveals that the impact of AI on employment depends on the industry, as some occupations are replaced by technology, while others require humans due to their complexity and the need for a personal approach. The information technology, banking and financial services, and manufacturing sectors are the most affected by the increasing use of artificial intelligence. In contrast, the healthcare, education, and retail fields witness the changes in the nature of work, as technology takes over routine and standardized tasks, leaving complex, non-routine, and creative work for humans. In general, each occupation may see an adjustment in the balance between automated and human-intensive tasks, depending on the level of standardization and the degree to which AI can perform them better than people. As a result, individuals holding non-routine, creative, social, and managerial occupations are likely to benefit from the rise of artificial intelligence. The table 2 summarizes the job automation, job augmentation, and emerging employment opportunities associated with AI across the six selected sectors and the figure 4 illustrates the relative employment effects of AI, highlighting differences in automation, augmentation, and emerging job opportunities across sectors.

Table 2. Comparative Employment Implications of AI Across Selected Economic Sectors

Economic Sector	Major Employment Implications	Emerging Employment Opportunities
Manufacturing	Automation of repetitive production tasks; workforce restructuring	Robotics engineers, automation specialists, industrial data analysts
Information Technology	Automation of coding and testing; shift toward advanced technical roles	AI engineers, machine learning specialists, cybersecurity analysts, prompt engineers
Banking & Financial Services	Reduction in routine clerical work; increased digital operations	AI risk analysts, fintech specialists, cybersecurity professionals, compliance experts
Healthcare	Automation of administrative and diagnostic support tasks; augmentation of clinical work	Clinical AI specialists, health informatics experts, digital health analysts
Education	AI-assisted teaching and administration; personalized learning	Learning technology specialists, AI curriculum designers, educational technologists
Retail	Automation of inventory management and customer support; expansion of digital commerce	E-commerce managers, customer analytics specialists, digital marketing professionals

Source: Compiled by the author based on OECD (2023), IMF (2024), World Economic Forum (2025), Stanford AI Index (2025), WHO (2021), UNESCO (2023), and International Federation of Robotics (2024).

Figure 4. Employment Implications of AI Across Selected Economic Sectors



Source: Compiled by the author based on OECD (2023); IMF (2024); WEF (2025); Stanford AI Index (2025); ILO (2025); McKinsey & Company (2023)

3.4 Emerging Skills Needed in the Future Workforce

Emerging skills needed in the future workforce show promise in diverse ways, including the substitution of human activities with those requiring more complexity and additional competencies. Literature shows that the workforce of the future will comprise more cognitive, digital, and interpersonal skills as humans work with AI to perform activities that require judgement, creativity, and cooperation (OECD, 2023; World Economic Forum, 2025).

Artificial intelligence and digital literacy is becoming an increasingly important skill needed in the workforce across six economic sectors as it enables workers to participate fully in the changing work environment. AI Literacy is a critical skill needed to operate AI and collaborate with it to perform diverse tasks ranging from generating insights. For example, in information technology and the banking and financial services sector, there is a need for higher skills in machine learning, data analytics, cloud computing, cybersecurity, and prompt engineering as firms invest in AI (Stanford AI Index, 2025; IMF, 2024). Conversely, analytical skills such as complex problem-solving, critical thinking, and judgement will also be in demand as humans work with AI to perform tasks that require decision-making, giving directions, and executing them proficiently. For example, medical professionals and teachers will need analytical skills to operate with AI to deliver health services and teach effectively (World Health Organization, 2021; UNESCO, 2023).

Since AI systems will take over many activities, including those that require cognition, judgement, and decision-making, human skills such as creativity, innovation, adaptability, and lifelong learning to co-exist with the systems will be needed. For example, in manufacturing, workers will operate AI systems, analyse data to make informed decisions, and deal with customers, requiring them to continuously learn new competencies to meet the demands of the changing work environment (ILO, 2025; WEF, 2025). The increased application of AI systems across industries will enable firms to operate more efficiently while transforming workforces and consequently jobs.

In addition to technical skills, workers will need human-centric skills such as communication, teamwork, leadership, creativity, and ethical understanding to function effectively with AI systems in the workplace. For example, communication and teamwork skills will be required in healthcare, education, and the retail sector as AI systems will not eliminate the need for human interaction but replace some aspects of work to make it more efficient and less strenuous (OECD, 2023; UNESCO, 2023; WHO, 2021). Similarly, creativity will be critical for workers in these industries who will operate AI systems that will eliminate many manual tasks, allowing them to focus on cognitively intensive tasks that require judgement, innovation, and creativity to increase efficiency. These advanced skills such as

leadership, teamwork, ethics, and creativity will also enable firms to utilise ethical AI to maximise the benefits of implementing the technology while minimising potential risks and challenges in diverse industries (UNESCO, 2023).

The above skills needed in future jobs that will involve working with AI systems demonstrate their significance and potential impact on the workforce. Although most sectors will require different technical skills to work with AI, the need for AI and digital literacy as well as enhanced analytical and communication skills will be necessary in most industries, hinting at their universal application. However, other workforce skills, including adaptability, will be in demand as these sectors embrace AI systems requiring humans to operate them. These skills will also enable workers to perform alongside AI, which is why they will be needed in most industries, albeit at varying levels, as humans interact closely with the technology across occupations. This knowledge about workforce skills needed in future jobs that involve the application of AI systems can help firms and workers invest in additional competencies to be productive in the future work environment. The figure 5 highlights the key technical, analytical, and human-centred skills required for workforce employability in an AI-driven labour market.

Figure 5. Emerging Workforce Skills for an AI-Driven Labour Market

Source: Compiled by the author based on OECD (2023); IMF (2024); ILO (2025); WEF (2025); Stanford AI Index (2025); WHO (2021)); McKinsey & Company (2023)

4. RECOMMENDATIONS

The results and discussion of the research suggest the role of governments, industries, educational institutions, and the workforce in leveraging artificial intelligence to achieve inclusive and sustainable labour market transformation. Thus, on the basis of the findings, the following recommendations are proposed.

4.1 Policy Recommendations: Policy makers must formulate policies that promote the responsible adoption of artificial intelligence while protecting jobs and vulnerable groups, ensuring data privacy, and promoting

digital literacy and continuous learning. Subsidizing and state support for digital infrastructure, workforce retraining, and lifelong learning should be intensified to enable people to participate and benefit from the digital economy. Additionally, policymakers should invest in facilitating partnerships between governments, industries, and educational institutions to effectively respond to the increasing demand for skilled workers in the changing labour market.

4.2 Industry Recommendations: Industries should adopt a human-centred approach to the development of artificial intelligence to augment the workforce instead of replacing workers where applicable. Firms should invest in continuous training and development, AI governance and ethics, and improving organisational processes through technology to enhance operational performance and remain competitive. There is a need for industries to implement workforce development strategies such as upskilling and reskilling programs specific to the needs of different occupations that are susceptible to AI adoption.

4.3 Educational Recommendations: Educational institutions should include AI literacy, data analytics, and digital technologies in their curricula to help students acquire digital skills and stay relevant in a technology-driven job market. Additionally, universities and colleges should partner with industries to offer relevant skills-based training that responds to the changing needs of the labour market. There is a need for instructional strategies that enable institutions to invest more in teaching creative thinking, human skills, ethics, and problem solving than technical skills in AI.

4.4 Workforce Recommendations: Workers need to invest more in continuous learning and upgrading of skills to stay relevant in an AI-driven labour market. The workforce should acquire skills in AI and data analytics, as well as communication, teamwork, and adaptability to remain competitive. Additionally, they need to develop creative, innovative, human, and ethical skills that will be in demand in the future economy.

5. CONCLUSION

Artificial intelligence is transforming the labour market by automating certain tasks, introducing new jobs, and raising the demand for occupations that require human skills in various industries. The comparison of the level of artificial intelligence adoption and exposure in different economic sectors indicates the extent to which firms are investing in technologies and how much various occupations are exposed to robotics. The study found that the information technology, banking and finance, and manufacturing sectors are moderately adopting AI and exposing their workers to technological exposure. Meanwhile, healthcare, education, and retail are significantly reliant on human skills, and thus, the use of robotics in these occupations is considered supplementary. Overall, the results suggest that, unlike replacing human workers with robots, AI is more likely to boost human capital by complementing workers' skills and abilities. As a result, the study concludes that technological breakthroughs such as artificial intelligence will lead to changes in the type of work and organisational processes as well as increased demand for continuous learning and workforce retraining. Therefore, the research recommends the need for government policies and programmes, corporate responsibility, and individual initiative in preparing the workforce for inclusive and sustainable transformation in the age of AI. The study examined several economic sectors and provided empirical evidence that can help policymakers, industries, individuals, and society at large understand the patterns of occupational exposure to artificial intelligence and make informed labour market and career development decisions.

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