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The effect of artificial intelligence on economic growth

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Abstract
A comprehensive assessment of artificial intelligence's effect on economic growth is the goal of this research article. The rapid advancement of AI has aroused the curiosity of lawmakers, economists, and corporate leaders due to the possible economic consequences it may cause. Gains in productivity, changes in the dynamics of the labour market, innovations, and general economic competitiveness are just a few of the ways that AI contributes to economic growth that this article explores. By integrating empirical research, case studies, and theoretical frameworks, we aim to offer a comprehensive grasp of the intricate relationship between AI adoption and economic progress.

Keywords: Artificial intelligence, economic growth, innovation

Introduction
Economists have long worried about how technological progress would affect the economy. There has been a dramatic increase in output with every new technological and industrial breakthrough. Academics are now concentrating on how AI will impact the economy, thanks to the development of AI. When it comes to science and technology, artificial intelligence is a huge step forward. The current body of research suggests that AI might significantly contribute to expansion (Gonzales, 2023a) [3]. According to studies conducted by Accenture Consulting in 2016, AI has emerged as a key component in manufacturing. It stresses that AI has the potential to aid economy development in three distinct ways. The capacity to automate complex physical tasks is the primary capability of artificial intelligence. On a second point, AI has the potential to improve the efficiency and effectiveness of both labour and assets that are already in existence. Lastly, AI has the potential to encourage original thought (Szczepański, 2020) [11].

Opportunities for investment and economic growth are propelled in large part by technological progress. A sea change has occurred in technology throughout the past ten years, with the advent and broad usage of artificial intelligence (AI) technologies marking a watershed moment (Babina *et al.*, 2024a) [2]. AI's predictive capabilities allow companies to swiftly and efficiently learn from large datasets, which in turn greatly enhances corporate decision-making. Consequently, AI has the potential to be a versatile technology that propels growth across several industries by boosting productivity and fostering product innovation (Lu, 2021) [7].

The effects of AI on economic expansion are discussed in this article. The ability of a computer to mimic intelligent human behaviour or "an agent's ability to accomplish goals in a range of circumstances" are two definitions of artificial intelligence (A.I.). These concepts immediately bring up fundamental economic problems. As an example, what would happen if AI made it possible to automate an increasing number of tasks that people used to do? (Gries & Naudé, 2020) [4] Economic growth and income distribution could be impacted by the widespread usage of artificial intelligence in everyday product and service production. But AI might change the way people come up with new innovation and ideas, making it easier to solve complex problems and inspiring more inventiveness (Trammell & Korinek, 2023) [17].

The effect of new technologies on the economy is a perennial worry for economists. There has always been a dramatic uptick in output following a big technological breakthrough. Academics are once again studying the effects of AI on the economy, because to the technology's rapid development (Babina *et al.*, 2024b) [2].

Artificial intelligence has just reached a new plateau because to developments in large data, technology, and algorithms. If AI continues to develop at its current rate, it will have far-reaching consequences for society and the economy, as well as for science and technology more generally (Gonzales, 2023a) [3].

There has been an upsurge in studies examining the effects of AI on various facets of society and the economy, including income inequality, employment, and the economy as a whole. In addition, we looked at how developments in artificial intelligence may affect the dissemination of important economic ideas and other subjects. We can learn more about the pros and cons of AI's emergence if we look at its effects on the economy. In light of this, we can craft sound policies to tackle future issues (Gonzales, 2023a) [3].

Discussions on the consequences for economic growth have arisen in response to the increasing prevalence of artificial intelligence (AI) in many areas of economic activity.

Innovations in digital technology and computer science, such machine learning and artificial intelligence (AI), have unavoidably found applications in vital sectors like healthcare, finance, manufacturing, and transportation (Gonzales, 2023a) [3]. The subject of whether these technologies impact economic variables is raised by their expanding application in industries. Technological progress, according to neoclassical and endogenous theories of economic growth, for instance, boosts productivity, which in turn drives the economy to grow. So, we should expect faster expansion thanks to developments in computing technology (Szczepański, 2020) [11].

For instance, industry has shifted in the past 60 years from using traditional inputs to relying on (ICT) technologies, which require more capital. Industrial processes saw changes with the advent of advanced computers, the Internet, and AI in the early 1990s. Consistent with the development of new technologies, Gonzales, (2023b) [3] developed a model for economic growth that takes into account technological advancements that reduce labour inputs while increasing the need for capital. In addition, these technologies have been recognized as potential sources of economies of scale in more recent studies on the subject. Innovations in information and communication technology will, therefore, almost certainly, boost productivity and economic growth (Babina *et al*., 2024a) [2].

Artificial intelligence (AI) is a huge step forward in technological innovation, and many believe it will boost productivity and the economy. Artificial intelligence (AI) and the digital revolution are the foundation of the second machine revolution, according to Brynjolfsson and McAfee. This revolution will lead to remarkable technical breakthroughs. The function of AI in stimulating economic expansion has been the subject of substantial empirical and theoretical research in the last several years. The pace of economic growth is affected by productivity, supposing that production inputs like capital and labour are constant (Gries & Naudé, 2020) [4].

Objectives of the study

1. To study how AI may improve productivity in different industries.
2. To learn more about how AI is changing the job market and the skills that employers are looking for.
3. To examine the potential policy consequences and barriers to AI adoption within the framework of economic growth.

Research Questions

1. How AI can improve productivity in different industries?
2. How can AI change the job market and the skills that employers are looking for?
3. What are the potential policy consequences and barriers to AI adoption within the framework of economic growth?

Literature Review

Our study offers some of the first in-depth statistics on the effects of AI investment on the economy. New studies shed light on how artificial intelligence (AI) is changing business processes in many different areas, such as robot-advising, financial technology (Fintech) innovation, loan underwriting, financial analysts, and entrepreneurship. Using data from Burning Glass job postings, Acemoglu *et al*. (2022) [18] examine how exposure to AI technology affects labour demand based on company occupation structure. Our data-driven methodology and extensive company employee database allow us to evaluate real AI investments in many sectors, illuminating the ways AI, as a general-purpose technology, might contribute to economic growth (Gonzales, 2023a) [3].

This notion is backed by our empirical study, which also sheds light on how AI fuels economic growth via facilitating product innovation, a long-held belief in its centrality to growth. Unlike previous technologies that relied on the task-based automation paradigm, AI does not seem to rely on labour substitution as its principal mechanism for delivering impacts at the company level (Szczepański, 2020) [11]. Contrarily, product innovation-a process that has received less attention in the literature on technology adoption-appearances to be the principal application of AI, according to our findings. Artificial intelligence (AI) brings up new possibilities for organizations as a prediction technology by facilitating faster and more efficient learning from massive data sets (Lu, 2021) [7].

What is AI?

Since the term "artificial intelligence" may apply to so many different kinds of technology, there is no agreed-upon definition. Nonetheless, similar AI concepts are used by international organizations. For instance, according to the EPRS, artificial intelligence refers to machines that are able to engage in "human-like cognitive processes," such as "learning, understanding, reasoning, and interacting (Haseeb *et al*., 2019) [5]." For all intents and purposes, AI can manifest as anything from "technical infrastructure (i.e., algorithms)" to a component of a manufacturing process to a final product for consumers. Consequently, AI technologies replicate human intelligence-demanding jobs, going above and beyond what is possible with conventional automation methods; their applications and uses are not limited to the industrial process (HE, 2019) [6].

While AI is commonly defined as "self-learning, adaptive systems" by the International Telecommunication Union (ITU). Consequently, artificial intelligence (AI) is defined in various ways. One way is by looking at "technologies, techniques, and/or approaches," like "a neural network approach to machine translation." (Szczepański, 2020) [11] Another way is by considering "purpose," like facial and image recognition. Still another way is by considering "functions," like the "ability to understand language,

recognize pictures, solve problems, and learn." Lastly, there is the way AI is defined by "agents or machines or algorithms," like self-driving cars and robots (Babina *et al*., 2024c) [2].

Gonzales (2023c) [3] also cite several national and international definitions of AI from sources like the OECD and the European Commission. As an example, AI is defined by the OECD as a "machine-based system" that can "operate with increasing levels of autonomy" and "make projections, suggestions, or judgments". Data analysis based on machine learning, autonomous drones, face recognition systems, virtual assistants, machine translation software, autonomous robotics, and Chatbots are some of the examples of AI given by the European Commission (2021). The French Institute national de la statuesque et des études économiques (INSEE) and other national statistics institutions define AI as "technology" that can carry out "cognitive operations traditionally handled by individuals."

The lack of a single, universally accepted definition makes it difficult to pinpoint existing AI systems, which is exacerbated by their breadth. Nevertheless, visual, analytical, functional, and interactive AI were the five types identified by Sarker (2022) [12]. Nevertheless, the terms "techniques" used to build smart systems in many real-world contexts are the most commonly heard when people talk about AI. Based on his research, Sarker (2022) [12] identified eight distinct "potential categories," which include: Fuzzy logic-based approach.

- Optimization searching, and Hybrid approach.
- Neural network and deep learning.
- Knowledge discovery, and Data mining.
- Rule-based modelling and decision-making.
- Machine learning.
- Natural language processing.
- Expert system modelling.
- Knowledge representation.
- Uncertainty reasoning.

Although there are many different AI approaches, the technology available today may integrate and apply to many different types. Therefore, it is not always feasible to categorize AI systems according to certain categories or approaches (Gonzales, 2023a) [3]. Additionally, there are many other kinds of AI technologies that are being developed throughout time, making AI development a vast and ongoing activity. To illustrate the point, in 2022, ChatGPT-a deep learning-based generative AI technology-was unveiled to the public. Its ability to interact with people and provide "full and practical answers" propelled it to the forefront of AI innovation (Marr 2023). "Foundational large language models" (LLMs) are the backbone of ChatGPT; they go beyond the scope of conventional NLP techniques.

In addition, AI's inherent characteristics could render its AI development distinct from competitors. Coiera (2019) [19] outlines what she calls the "miles" as the three main phases of AI development. Gathering data, doing preliminary processing, and "cleaning" are all part of the "first mile." Building and testing several algorithms using the initial data set is the "middle mile" of the process. "Embedded in real-world processes and analysed for effect on real-world results" is the final step in testing and refining an AI system.

Problems arise at every stage of artificial intelligence development. "Foundational concerns," including collecting and organizing large amounts of high-quality data, make up the first mile. The potential "bottleneck" that might arise from the need to acquire massive amounts of data is a "roadblock to technological usage." Intermittently, "data-driven algorithm development" presents obstacles such as "biases, replicability, causal inference, avoiding overfitting on training data, and enhancing the generalizability of any models and algorithms" throughout the middle mile (Lu, 2021) [7].

Last but not least, the third mile presents what is arguably the most challenging task. Truthfully, "AI does not execute anything on its own," hence AI systems are compelled to "connect" to the real world. To put it plainly, the impact of an AI system needs to be "significant and meaningful."

For instance, "more nuanced" and "less aggressive" methods of cancer diagnosis and treatment are required rather than more precise cancer diagnoses given the present circumstances. Accordingly, the "last mile" is the application of AI to practical tasks. Measurement, generalization and calibration, and "local context" are three of the many challenges that AI implementation faces (Coiera 2019) [19].

AI and Economic Growth

Artificial intelligence boosts economy by stimulating improvements in supply and demand. Enabling the current workforce with AI technology, and automating activities with robots and "autonomous vehicles," AI has the potential to enhance company efficiency. However, by offering "personalised and/or higher-quality" products and services, AI may increase consumer demand. The result is that by 2030, AI may have boosted the world economy by as much as USD 15.7 trillion (Gonzales, 2023a) [3].

Manufacturing, healthcare, banking, energy, and transportation are just a few examples of industries that can benefit from AI. Artificial intelligence (AI) aids healthcare services in several ways, including early illness detection and diagnosis, the realisation of "potential pandemics and tracking occurrence," and the provision of "imaging diagnostics" in pathology and radiology (Gonzales, 2023b) [3]. At the same time, anti-money laundering and fraud detection are two examples of AI applications in banking. In addition, "robo-advice" and other AI-powered tools offer "customized investment solutions" to help clients achieve their financial goals and make the most of their assets. "Autonomous trucking and delivery," traffic management systems, and improved transportation security are other benefits of AI (Babina *et al*., 2024a) [2].

To determine how AI affects endogenous growth, Lu (2021) [7] has just produced a theoretical framework. As Lu (2021) [7] puts it, AI "can learn and gain knowledge by itself," drawing parallels between it and the buildup of human capital. Second, AI may be used in production without reducing its ability to acquire more AI, as it is a "nonrival input." This establishes AI as an independent input, apart from physical capital. In addition, the three-sector endogenous development model shows a balanced growth path according to Lu (2021) [7], where variables like AI and production rise at the same rate. A significant increase in productivity has always followed a major technological breakthrough in industry. The most defining technological innovation of our time, artificial intelligence, contributes to economic growth in three main ways: To begin, by automating formerly human-intensive tasks, intelligent technology may one day displace the need for human

workers altogether (Gries & Naudé, 2020) [4]. This strategy replaces expensive human labour with less expensive capital, which has the dual effect of reducing labour costs and increasing business productivity. Secondly, AI has the potential to assist workers. Machine learning and other AI approaches have the potential to improve overall factor productivity by facilitating the planning, control, and monitoring of design, production, and equipment operation; thirdly, intelligent technology may aid businesses in their technological advancements. By enhancing communication and decreasing the cost of information transmission across businesses, intelligent technology is revolutionizing the way we do business (Trammell & Korinek, 2023) [17].

Consequently, smart technology encourages creative endeavours, boosts the information spillover effect, and lowers technical barriers. In addition, smart technology may glean important details from massive databases, leading to a wealth of explicit knowledge. Therefore, intelligent technology can foster technological growth through technology spillover and information identification (Babina *et al*., 2024b) [2]. The early stages of intelligent technology application are plagued by a lack of high-quality talents due to AI's high standards for information infrastructure construction and labour quality. Additionally, most positions that require high-level skills cannot be fully replaced by AI, which diminishes or eliminates the economic benefits of AI. An essential factor in enhancing a nation's fundamental competitiveness, as found by D.H. and Dorn D., is a highly trained labour force that conforms to technological progress and economic structure. According to Liu J. *et al*., top-notch talent is essential for AI research and development (Lu, 2021) [7].

Theoretical Framework

Theories attempting to explain the effects of AI on economic growth have relied on economic growth models. Here, Hanson aimed to evaluate AI's monetary effect by applying neoclassical ideas of economic development. Depending on the job at hand, technology may either augment or supplant human workers, according to this paradigm (Haseeb *et al*., 2019) [5].

The model also presumes that computer technology advances at a higher pace than general technology and that human labour input to AI can improve at the rate of necessity, leading to an order of magnitude boost in economic growth rate when AI is used in batches. Because it doesn't take into consideration the possibility of new types of occupations being created, the authors argue that their method may underestimate the economic impact of AI (HE, 2019) [6].

The aforementioned shortcomings were remedied by the work of Restrepo and Acemoglu. Assuming an endogenous number of tasks, they provide automation approaches based on the task-based paradigm. This method is novel because it lays out a comprehensive plan to automate jobs that used to need a lot of manual effort while simultaneously generating whole new jobs that require a lot of manual labour. The results show that automation affects productivity in addition to substitution. Worker demand for non-automated jobs rises as a result of the productivity impact, which boosts output by displacing labour with cheaper capital (Acemoglu & Restrepo, 2018) [1].

Acemoglu and Restrepo (2020) [20] state that rapid automation adoption and a skills gap between the workforce and new technologies are two factors that can slow labour productivity gains. The need for new talent will slow economic growth if these skills aren't produced quickly enough by the educational system. In addition, the labour market is not perfect and the current tax system Favors capital over labour, thus the equilibrium compensation will be larger than the social opportunity cost of working. Because of this, automation technologies will be used too much, resources will be wasted, and workers won't be as productive as they may be (Trammell & Korinek, 2023) [17].

Methodology

Data collection

Data mining allows for the repurposing of previously acquired information from secondary sources. Books, journals, magazines, and websites are examples of secondary sources that researchers use since they include information that has already been discovered. There is a marked difference in the methods used to collect primary and secondary data. You need to use analytical methods while working with secondary data. To demonstrate the research problem, secondary sources will be utilized. As for secondary sources, they will include things like printed journals, online books, and previously published studies.

We will offer data that is both quantitative and qualitative. Two common types of empirical research, case studies and surveys, almost always make use of secondary sources. Surveys and research papers were among the several data sets compiled by Saunders *et al*. (2017) [21]. Documents include periodicals like newspapers and magazines. You may find all of the company's reports, journals, meeting minutes, notifications, and communications here. The written word can be supplemented by visual and audio media such as television shows, movies, DVDs, and photography. Local authorities often supply a plethora of information that may be found in secondary data sources. The researcher is removed from the data gathering process, which is a drawback of this source. Websites, technical journals, yearly reports, innovation papers, and international business journals were all part of the extensive bibliography for the study.

Results

Productivity gains

Research has mostly focused on the massive monetary effects of AI. According to Accenture's analysis, which includes 12 industrialized economies that make up over half of the world's economic output, artificial intelligence (AI) may cause yearly global growth rates to treble by 2035. There are three main ways in which AI will drive this growth. To start with, new technology will make worker time management much more efficient, leading to a marked increase in labour productivity (sometimes as much as 40%). The second is that AI will create a new kind of virtual workforce that can learn and solve problems on its own—what the authors call "intelligent automation" in their study. Third, as innovation spreads, it will benefit the economy by influencing various sectors and creating new income streams (Babina *et al*., 2024c) [2].

Accelerated AI development and application may increase global GDP by 14% (or $15.7 trillion) by 2030, says PricewaterhouseCoopers (PwC). Based on the data generated by the Internet of Things (IoT), which is anticipated to be significantly higher than the data generated

by the existing "Internet of People," the research predicts that the data will be used to unleash the next wave of digital revolution. It will enhance product and service customisation while simultaneously increasing uniformity and, consequently, automation (HE, 2019) [6]. According to PwC, there are two main ways in which AI will impact economies throughout the world.

Some believe that AI will have an immediate impact on capital-intensive sectors like manufacturing and transportation by automating mundane tasks, leading to higher efficiency. Robots and self-driving automobiles will be used more often as a result of this. Using AI to augment and assist current employees will also help businesses, as it will increase productivity. Investing in AI-based software, systems, and robots will be necessary. Workers will be able to accomplish their responsibilities more efficiently and with less effort, and they will have more time to devote to engaging in activities that bring more value. Overall productivity would rise as a consequence of automation as it would decrease the need for human labour (Gonzales, 2023a) [3].

More data will be generated as a consequence of increased consumer demand for AI-enhanced products and services, which means their availability will grow in importance over time. "In turn, more consumption fosters a virtuous cycle of more data touchpoints and so more data, better insights, better goods, and consequently more consumption," says PwC. While AI will have positive effects all throughout the globe, the United States and China stand to gain the most (HE, 2019) [6]. The former is expected to swiftly introduce a number of useful technologies, with the benefits being expedited by better customer comprehension, faster data aggregation, and advanced AI preparation on the part of both enterprises and consumers (Gonzales, 2023b) [3].

It will take some time for China to experience the whole effects of AI, but it will start with the country's enormous manufacturing sector and work its way up to increasingly complex and tech-driven production and trade. While wealthy nations are anticipated to witness substantial gains from AI, poorer nations are anticipated to witness more moderate increases as a result of lower rates of AI adoption (Lu, 2021) [7].

The McKinsey Global Institute predicts that by 2030, more than 70% of firms will have implemented some kind of artificial intelligence, with just 50% of large companies using all of the available technologies. According to McKinsey, artificial intelligence has the potential to increase global GDP by around 1.2 percent annually, or an extra US$13 trillion, by 2030. More product and service innovation and automation of previously human-only tasks will be the primary forces behind this shift. Additionally, negative externalities like decreased domestic consumption due to unemployment are thought to be the source of the shock that AI is predicted to inflict on labour markets, together with the costs of regulating these developments (Gonzales, 2023b) [3].

Analysis Group, with funding from Facebook, produced research in 2016 claiming that AI will positively impact GDP, productivity, and employment in both direct and indirect ways. Businesses and sectors involved in the research, development, and production of artificial intelligence (AI) will see an uptick in revenue and job opportunities as a direct result, and whole new economic activities will be born out of this. Increased productivity in sectors that employ AI to enhance knowledge and information access, optimize business processes and decision-making, and so on will have a multiplier effect on other sectors. Generally speaking, they anticipate far lower growth (US$1.49-2.95 trillion) in the coming decade (Trammell & Korinek, 2023) [17].

Labor Market Dynamics

Over time, as AI develops, the cost of automation will decrease, and robots will gradually supplant humans in the workforce. Actually, it's not a new occurrence for technical developments to cause robots to replace human workers. Numerous economists have studied the question of whether technological progress raises or lowers employment levels since the start of industrialization in the late 18th century. Based on the available data, technological advancements can have positive and negative effects on job opportunities (Haseeb *et al*., 2019) [5].

On the one hand, new technologies boost productivity in the workplace but also eliminate certain human workers' jobs. For instance, according to Schumpeter, there will be a rise in unemployment and a fall in demand for labour as a consequence of process innovation's saving impact, even while technical innovation and productivity gains will temporarily boost demand for the main ingredients required to make new goods. Capitalization effects, on the other hand, make new job opportunities possible as a result of technical advancement (HE, 2019) [6].

The expense of creating jobs via capitalization has already been paid for. The present value of profits rises and the effective discount rate of future earnings falls as technology advances quicker. Companies will increase employment opportunities and production size to maximize profits. There is some disagreement among academics as to which of the two impacts listed above is more important. Even while unemployment has gone through periodic ups and downs over the past two centuries, there is no proof that technological progress has led to a sustained rise in the jobless rate. This is due to the fact that automation and technical innovation have not replaced more workers (Gonzales, 2023a) [3].

Artificial intelligence (AI) follows in the footsteps of previous technology revolutions by greatly improving production while simultaneously freeing up human labour. Furthermore, AI serves a variety of supplementary purposes. When compared to previous technology revolutions, AI's speed, breadth, and depth stand out. By automating traditionally manual tasks, advancements in machine learning have paved the way for the computerization of manufacturing processes (Szczepański, 2020) [11]. Human intelligence is being supplanted by machines. This machine goes beyond simply enhancing human talents; it might revolutionize work in many ways, impacting industries that have been untouched by technology up until now. Rapid and extensive replacement of labour has been made possible by AI advances. Concerns about job automation, AI's effect on the overall job market, and AI's influence on the organizational structure of the workforce are the primary foci of current studies examining these effects on the labour market (Lu, 2021) [7].

Discussion

Using neoclassical growth models, task-based models, or empirical research, the study first investigates the impact of

AI on economic development; nonetheless, whether or not AI will achieve singularity remains an open question. Artificial intelligence (AI) will generate labour substitution and new jobs, according to scholars. However, no one has yet agreed on which effect would be more significant; this may depend on how the market functions. Not only that, but according to most studies, reducing automation costs would lead to a rise in wage disparity between different types of workers and a decrease in the labour income share, both of which would exacerbate short-term income inequality. Consequently, a large number of writers hold the view that appropriate public policies must be devised to counteract the possibility of employment losses brought about by AI (Babina *et al*., 2024c) [2].

To combat the possible negative effects of AI on unemployment and economic inequality, experts have proposed measures include increasing funding for workforce training and education, establishing a universal basic income program, and taxing robots. An important subject to discuss is the economic implications of AI. The effects of artificial intelligence (AI) on future GDP growth, the size and composition of the labour force, and income inequality are largely unknown as the technology is in its infancy both in terms of study and implementation.

Individuals will be better equipped to cope with the effects of AI if more academics devote more time and energy to studying the economic effects of the technology, debating how to create the best policies to lessen the blow of technological progress, and working to make sure that everyone benefits from AI (Gonzales, 2023a) [3].

Policy Implications

In response to concerns about AI's potential drawbacks, researchers have looked at many legislative options, the most popular of which being boosting employee training and education. While the emergence of AI might put low- and middle-skilled individuals out of work, helping those from disadvantaged backgrounds get the training they need to get back into the workforce could mitigate or even reverse this trend. Professional retraining and personnel who can think on their feet and adjust to new situations will thus be in high demand. As technology advances, governments should help educate the public on new skills, reskill workers so they can make better use of AI in the workplace, and facilitate easier job transfers.

Improving education and workforce training has been emphasized in several studies, along with specific solutions. The importance of education cannot be overstated, according to Glaeser *et al*., who also stated that the US should allocate specific funds to education and workforce training in order to assist workers, especially those with intermediate and low skill levels. To make jobs harder to automate, society must place a premium on training and preparation that is directly connected to the work, according to Thierer *et al*. It is crucial to know how to cultivate certain technical abilities in this era of globalization. Math, science, and communication should be the top priorities in elementary and secondary schools. More students, especially those from low-income families, should be able to afford college. Lessons should be based on what employers are looking for in employees, and universities should find ways to train specialized skills while also encouraging more people to become managers, professionals, and entrepreneurs.

To add insult to injury, there are substantial obstacles to training that low- and medium-skilled people must overcome before they may rejoin the workforce. Given the unprecedented pace of technological advancement, Arntz and colleagues found that it is more challenging for people with lower levels of education to reestablish their comparative advantage by training. Institutional and cultural support are essential for societal advancement, according to Bessen, and many regular workers find it slow and difficult to acquire new knowledge and abilities.

Conclusion

Artificial intelligence (AI) developments have been there since the 1970s, but their influence and use have grown substantially in the previous ten to fifteen years. The exponential growth of AI and overall patent registrations around the turn of the century, together with the pervasive, tangible, and intangible effects of this technology on people's daily lives, demonstrate how AI and related technologies have altered the economic landscape (Lu, 2021) [7]. Using natural language processing to forecast client behaviour and, eventually, boost income, has been a boon for many companies, particularly those engaged in online sales. Contrarily, AI and ML are indispensable to MNCs when it comes to improving their supply chains for a variety of purposes, such as demand forecasting, predictive scheduling, inventory and risk management, predictive maintenance, and many more. Modernizing manufacturing processes, reducing human inefficiencies, and improving the customer experience have all been helped along by advancements in AI and associated ICT. This is true across all sectors and enterprises. Already impacting our world in profound ways, artificial intelligence is quickly becoming an integral part of our daily lives and economic systems. There is intense competition among countries throughout the world to reap its benefits, and new world powers like Asia and the US have arisen. There is a widespread belief that artificial intelligence will spur increased output and GDP. The analysis of massive amounts of data has the potential to greatly improve efficiency and decision-making. In addition to boosting demand for existing products and services and generating new revenue streams, it has the potential to inspire the creation of entirely new markets, industries, and things (Babina *et al*., 2024c) [2].

But AI may drastically change business as usual and how people live their lives. The creation of "super companies," or concentrated areas of wealth and competence, according to others, would be bad for the economy as a whole. It has the potential to widen the gap between rich and poor countries, boost demand for certain skills while rendering others obsolete, and perhaps alter the nature of work in significant ways. The possibility for it to reduce wages, the tax base, and increase inequality is another source of concern for experts.

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