

The Impact of Artificial Intelligence on the Global Economy and Market Competitiveness: Opportunities and Challenges

<https://www.doi.org/10.56830/WRBA07202504>

Ali Mohamed Ali Mohamed El-Mhalawy

Lecturer, Department of Economics, Higher Institute of Administrative Sciences and Foreign Trade - Egypt

Ali3sham28@gmail.com

Abstract:

This study looks at how Artificial Intelligence (AI) affects the world economy and markets. It shows how AI helps increase productivity and efficiency, and how it changes the way companies and countries compete. The study also explains what AI is, its types, and how it is used in different economic areas. It highlights some of the main challenges, like the gap between countries in technology. Using a descriptive and analytical methodology, this study provides a comprehensive view of the opportunities AI offers for achieving sustainable economic growth and its potential impact on global trade and economic competitiveness. It also highlights the future trends of this emerging technology and its impact on both developed and emerging markets, while offering recommendations to stakeholders on the best ways to leverage AI responsibly and sustainably.

Keywords: Artificial intelligence, global economy, competitiveness, international trade, emerging markets.

Introduction

Artificial intelligence (AI) has become a transformative presence of our time, profoundly affecting the worldwide economy and the structure of markets. Significant advancements in machine learning and data analytics have caused major changes in how things are made, marketed, and how businesses function. This positions AI as a primary factor in promoting economic effectiveness and encouraging innovation.

This research examines the evolution of AI and how it shapes international markets, specifically looking at its part in improving productivity and changing how competitive companies and countries are. It also considers the problems that AI brings, including rules, ethics, and socio-economic issues, such as the disappearance of traditional jobs and the growing technology gap among different nations.

The goal of the study is to provide a complete understanding of AI's capabilities and limitations. It will propose strategies that make the most of its advantages while limiting the risks. It will emphasize opportunities like lowering costs and improving efficiency, as well as difficulties connected to implementation and global inequalities.

The general framework of the research

1- Research problem

AI is changing the world economy. It helps businesses work faster and better, but it also causes problems like people losing jobs and more inequality between countries. This research looks at how AI affects the economy, what problems it brings, and how it can help countries grow.

2 -Research hypothesis

The research is based on the following key hypotheses:

- AI has a positive influence on the economy by increasing efficiency and productivity, but it also introduces challenges to market competition and global trade dynamics.
- AI adoption may widen economic gaps between developed and developing countries due to differences in digital infrastructure and technological abilities.

3- The importance of research

This study highlights the expanding role of AI in the global economy and its effects on productivity, employment, and competitiveness. Its purpose is to provide insights into dealing with AI-driven challenges and to offer recommendations for effective economic and regulatory policies.

4- Research objectives

The research aims to:

- Explain what AI is and how it is used in business.
- Study how AI changes productivity and competition.
- Find the main problems in using AI.
- Look at how AI can help countries grow.
- Give ideas to get the good results of AI and reduce the bad ones.

5- Research methodology

This study uses a descriptive and analytical method, combining a review of existing literature, data analysis, and a comparison across different economies.

6- Research Scope

- Subject boundaries: The research concentrates on studying AI within economics and markets, without venturing into other areas like medicine or security.
- Timeline: The research analyzes the developments and influence of AI over the past twenty years, with a focus on future trends.
- Geographical boundaries: The research analyzes the impact of AI at the global level, highlighting the gaps between advanced and developing economies.

The structure and content of the research

The Nature of Artificial Intelligence

1-Definition of artificial intelligence: If we want to integrate artificial intelligence into society, we need to understand what it is. What do we mean by artificial intelligence? How has this technology evolved? Where are we now?

Defining artificial intelligence is not easy; in fact, there is no generally agreed-upon definition of this concept. Many different definitions are used, which can easily lead to confusion. Therefore, it is important to clarify our use of this term. We begin by discussing various definitions of artificial intelligence, then explain the definition we have settled on. The wide variety of definitions in circulation is not due to neglect, but rather to the phenomenon of artificial intelligence itself. (Sheikh, 2023)

Artificial intelligence is defined as the ability of a machine to mimic the human mind and how it works—that is, its ability to think and explore. With the significant advances in computers, it has become clear that they are capable of performing tasks more complex than we could ever imagine. They can explore and prove complex mathematical theories, perform tasks quickly, accurately, and have large storage capacity. However, no program yet matches the flexibility of the human mind, especially in the deductive and analytical tasks it faces. (Studies, 2021).

artificial intelligence It is a field of computer science, It seeks to design systems and software capable of simulating aspects of human intelligence. Artificial intelligence aspires to create devices and software capable of performing tasks typically considered the domain of humans, such as thinking, making decisions, finding solutions to problems, learning from experience, and interacting with their surroundings (Samah, 2024).

And The Organization for Economic Cooperation and Development also defines artificial intelligence as: he :A machine-based system that infers from the inputs it receives, for explicit or implicit purposes, and how to generate That one Outputs such as predictions, content, recommendations, or decisions that may impact physical or virtual environments. (OECD publishing, 2024). On the other hand, there are some applications that have been able to match the performance level of experts and professionals in performing specific tasks. These applications include medical diagnosis, computer search engines, and the ability to recognize voice and Bedouin writing.

2-History and development of artificial intelligence:

In the past few years, artificial intelligence has taken over AI has taken center stage in the technology industry and has become a common term. Despite its recent surge in popularity, the concept has been around since 1955, when John McCarthy organized a workshop on artificial intelligence at Dartmouth College. However, it has only recently become clear that AI's true potential has been realized, driven by developments in technologies such as graphics processing units (GPUs), the internet, and large language models (LLMs). AI is no longer confined to theoretical discussions; it has become an integral part of our daily lives (AVICENA, 2024).

In 1943, neurophysiologist Warren McCulloch and logician Walter Bates collaborated on a groundbreaking paper titled "A Logical Account of the Ideas Underlying Nervous Activity," published in the Bulletin of Mathematical Biophysics. The main goal of their work was to investigate the possibility of representing logical functions by networks of artificial neurons (Ian Ritchie, 2024).

Another figure who had a significant impact on the foundations of computing and artificial intelligence was Alan Turing, the mathematician, logician, computer scientist, and cryptographer, who made a huge impact with his 1950 book, *Computing Machinery and Intelligence*. In this pioneering work, Turing introduced the concept of the "Turing test," offering a method for assessing a machine's ability to exhibit intelligent behavior similar to that of a human. Despite the criticism it faced, this test played a pivotal role in shaping discussions about artificial intelligence, leaving a lasting mark on the field.

However, the term "artificial intelligence" has been introduced. (AI) was formally introduced during the Dartmouth Conference/Workshop in 1956 by John McCarthy. This conference was considered a landmark event in the history of artificial intelligence, as it brought together researchers with a common interest in studying how machines could simulate human intelligence. John McCarthy, along with influential figures such as Marvin Minsky, Nathaniel Rochester, and Claude Shannon, organized this important gathering at Dartmouth College. During this pivotal occasion, McCarthy coined the term "artificial intelligence," embodying the field's focus on the study and research aimed at creating machines capable of performing tasks traditionally associated with human intelligence. In 1961 the first Unimate industrial robot has begun work on the assembly line at General Motors in New Jersey. where He was tasked with moving mold casings and welding parts onto cars (which was considered very dangerous for humans). In 1963, the Artificial Intelligence Laboratory was established at Stanford University. SAIL) In 1965, Edward and Joshua created the first expert system as a form of simulation for thinking and decision-making. In 1966, Joseph created language processing to talk to humans. In 1968, the Soviet-born scientist Alex took a new approach to artificial intelligence known as deep learning. (Ian Ritchie, 2024).

In 1972, Stanford University unveiled a system MYCIN, a system designed to diagnose blood diseases and prescribe medications. These pioneering systems were based on an "inference engine" programmed to mimic human reasoning logically. Although they provided expert-level responses to data input, their development was short-lived due to the extensive programming work required and the need for 200 to 300 rules. This approach led to a so-called "black box effect," which obscures the automated reasoning process. In 1979, the first self-driving vehicle was created and successfully moved without human intervention. In 1980, the first expert system was introduced to the commercial market, known as XCON It is an assistant in automatic selection according to what the customer wants, and developments continued until the year 1988, when Rollo Karanter invented the chat robot, which he programmed for automatic conversation.

As a result, the programming complexity made these systems difficult to develop and maintain, prompting the exploration of faster, less complex, and more cost-effective alternatives.

The landscape changed with the advent of the Internet in the early 1990s, which created an abundance of data for training models. In 1997, The program was able to Deep Blue Which was developed by IBM achieved a historic achievement by defeating chess champion Garry Kasparov. Deep Blue relied on a systematic algorithm based on brute force (Dave & Nick, 2019). And the company's stature WIDOWS By releasing a speech recognition program in 2000, Syntha developed the first robot capable of simulating human emotions, which includes eyes and ears, the senses of seeing and hearing. (Ian Ritchie, 2024).

In 2002, the first robot was launched to clean the floors in your home. In 2003, the first robot landed on Mars without human intervention. In 2006, companies like Twitter and Facebook began using artificial intelligence as part of their advertising algorithms. In 2011, IBM's Watson computer system participated in the popular game show "Jeopardy!" and achieved a landslide victory. Watson, meticulously designed to understand natural language and answer questions, competed against two of "Jeopardy!"'s most prominent champions, Ken Jennings and Brad Rutter. The competition kicked off with Watson demonstrating its skills in processing and understanding natural language, analyzing massive data sets, and providing accurate answers. This event served as a showcase for significant developments in the field of artificial intelligence and natural language processing capabilities (Dave & Nick, 2019). The achievements continued until OpenAI, the company behind ChatGPT, introduced several GPT transformers, with GPT-1 debuting in 2018. GPT-2 was not released to the public, and GPT-3, unveiled in June 2020, reached a record high with an impressive 175 billion parameters, making it one of the most powerful language models of its time. GPT-3's capabilities extend to generating coherent, contextually relevant, and human-like text based on input prompts. It can perform a variety of natural language processing tasks, including answering questions. The model is made available through OpenAI's API, allowing developers to integrate language generation capabilities into their applications and services. In 2022, OpenAI introduced ChatGPT, which features a chat-based interface built on top of GPT-3.5.

3-Different types of artificial intelligence

The methods for organizing various AI approaches are constantly evolving. In 2024, we can classify AI into at least seven distinct types: three capability-based and four function-based, which generally correspond to Maslow's hierarchy of needs. The simplest AI technologies correspond to the basic survival level in Maslow's model. The most advanced AIs are self-aware and correspond to the self-actualization level in this model.

The four functional types of AI are:

- interactive machines
- limited memory
- theory of mind
- self-conscious

Current AI technology has evolved beyond the first type of interactive machines. The third and fourth types are merely theoretical and represent the next stage of AI development.

Artificial Intelligence in Economics and Markets

1- How AI Enhances Efficiency and Productivity.

Managing your workforce efficiently is essential to maintaining the Projects, AI-powered tools are increasingly being used to streamline work processes and improve productivity like:

- **Work scheduling and task assignment:** AI systems can optimize work scheduling by analyzing factors such as worker availability, skill sets, and task requirements. This ensures the right workers are assigned to the right tasks at the right time, improving the overall efficiency of the project. AI algorithms can also adjust schedules in real time, taking into account variables such as weather conditions, job site delays, or absenteeism. Scheduling Operations, with Reduce labor costs and ensure efficient use of the workforce throughout the project period.
- **Boost productivity by tracking workers with the help of artificial intelligence.** AI-powered wearables and tracking devices can monitor worker productivity and safety in real time. These devices track movements, monitor vital signs, and ensure that workers are performing their tasks efficiently. By analyzing this data, AI systems can identify patterns and provide insights into worker performance, enabling managers to make adjustments that boost productivity. For example, AI can suggest breaks or task changes to reduce fatigue and prevent accidents. Additionally, AI can help monitor worker adherence to safety protocols, reducing the risk of injury and enhancing overall safety.

In addition, artificial intelligence plays a crucial role in improving productivity, reducing costs, and enhancing safety. AI-powered machines, robotics, supply chain management, and time management technologies enable and improve every stage of the process, from preparation to project completion. And These innovations are transforming Production industry Towards a more efficient, sustainable and technologically advanced sector (Kounde Gavi, 2024). In conclusion, creativity and emerging markets support AI in creating new products, services, and fields. For example:

-Healthcare: AI accelerates drug discovery and advances personalized medicine.

-Finance: AI-powered algorithms improve risk assessment and fraud detection.

-E-commerce: AI makes customer experiences more personalized, boosting sales and customer loyalty.

2-Key Applications of Artificial Intelligence in Business.

Many practical applications of artificial intelligence systems have emerged, including robotics, automobiles, social media, data security, finance, gaming, astronomy, healthcare, transportation, agriculture, learning, e-commerce, and entertainment (Olayiwola, 2024) :

A figure showing the different applications of artificial intelligence. (Olayiwola, 2024) :

- **Robots:** These are automated machines, such as "Sophia," which recently obtained Saudi citizenship. These robots support perception, thinking, action, learning, and interaction. They are used in areas to improve human well-being, such as providing services, protecting against hazards

such as mines, transporting waste, precision industries, or automatically controlling aircraft, cars, and ships. (Ibrahim, 2024).

- Transportation
 - Self-driving vehicles: The transportation sector has seen advancements to reduce human intervention. More than 80 companies have contributed to developing these vehicle technologies, investing an estimated \$3 billion in 2021. (Authority, 2022)
 - Autonomous Aircraft: The global market was valued at USD 19.01 billion in 2023 and is expected to grow to USD 40.67 billion by 2032, at a CAGR of 8.18%. North America dominates this market with a 42.29% share in 2023. (Size, 2024)
 - Autonomous vessels: These include commercial, defense, and private vessels, used in many countries in Europe, Asia, North America, the Middle East, and some African countries. The market is expected to grow at a rate of 9.2% between 2021 and 2028. (Data Bridge), reaching \$28.803 billion by 2028. The Asia-Pacific region is expected to dominate this market, followed by Europe, due to the rising demand for autonomous cruise ships. (Global, 2024)
- Healthcare: Artificial intelligence is increasingly used in healthcare. Through Machine learning algorithms analyze medical data such as images, patient records, and genetic information, helping in the early detection of diseases such as cancer, diabetes, and cardiovascular disease. For example, AI-powered tools such as IBM Watson for drug discovery and precision medicine, providing personalized treatment recommendations. A study by Esteva et al. (2017) demonstrated the effectiveness of deep learning models in diagnosing skin cancer, matching or outperforming dermatologists.
- Finance: In the financial sector, AI is being applied to risk management, fraud detection, and trading. AI algorithms analyze massive amounts of data to predict market trends, optimize investment portfolios, and identify fraudulent activity by detecting unusual patterns in transaction data. Financial institutions such as JPMorgan Chase are using AI to automate administrative tasks, improve customer service through chatbots, and develop more secure authentication systems.
- Education: AI is reshaping education through personalized learning, automated assessment, and AI-powered tutoring systems. By analyzing student performance data, AI can recommend personalized learning paths, allowing students to learn at their own pace. AI-powered tutoring systems, such as those developed by companies like Carnegie Learning, provide additional support for students who need extra help outside of the classroom.

3-The impact of artificial intelligence on global markets.

The rapid adoption of AI is similar to historical technological revolutions, such as the Industrial Revolution and the advent of the Internet. However, its diffusion across various sectors has been unprecedentedly rapid. Generative AI tools, such as GPT-4, issued in 2023, focuses on human capabilities in specific tasks, making AI a key resource for countries seeking to achieve competitive advantages.

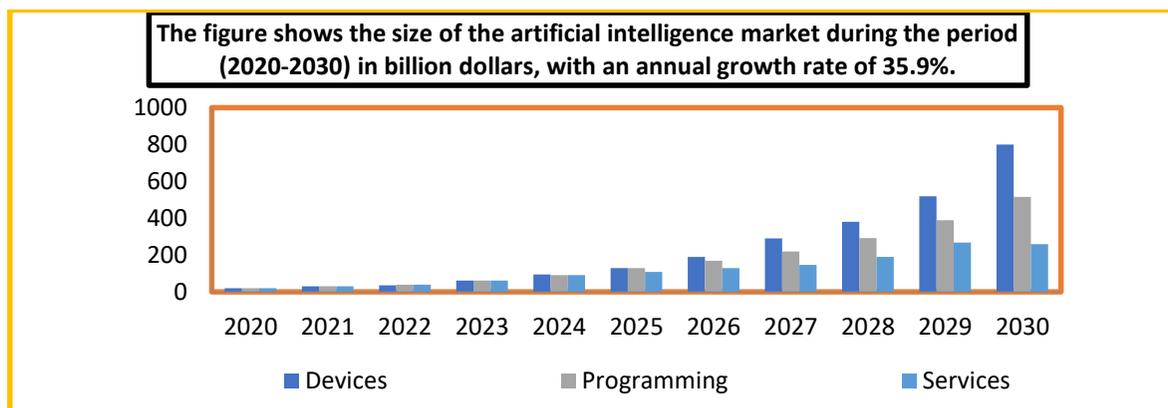
The impact of artificial intelligence extends to shaping economic policy frameworks at both the national and international levels. Policymakers are forced to reconsider:

- **Trade agreements:** Integrating AI-specific provisions to address cross-border data flows, intellectual property rights, and labor market disruptions.
- **Tax policies:** Adjusting tax structures to include AI-led shifts in labor markets, as automation may reduce taxable income from wages but increase firms' productivity.

For example, the European Union is focusing on developing ethical AI while simultaneously seeking to align member states on policy approaches to enhancing global competitiveness.

4-Artificial Intelligence Market Size and Trends

The global artificial intelligence market size is estimated at USD 279.22 billion in 2024 and is expected to grow at a CAGR of 35.9% between 2025 and 2030. Continuous research and innovation led by tech giants are driving the adoption of advanced technologies in key industrial sectors, such as automotive, healthcare, retail, finance, and manufacturing.

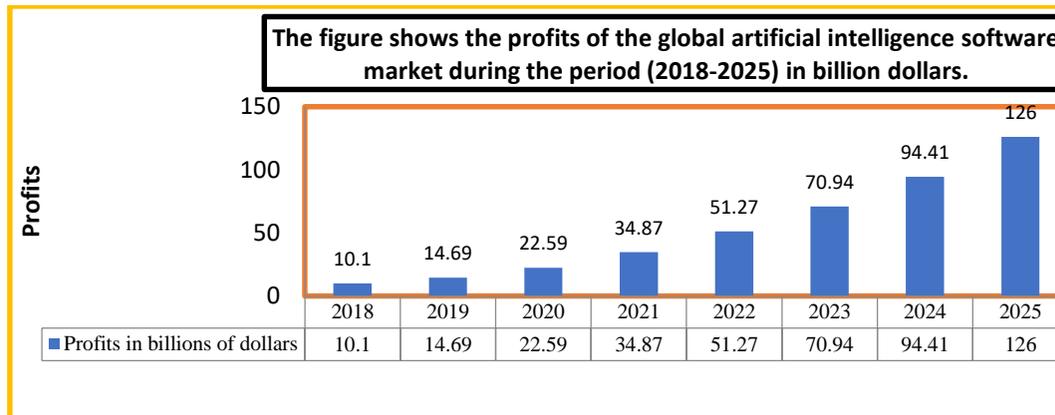


Source: Artificial Intelligence Market Size, Share & Trends Analysis Report By Solution, By Technology (Deep Learning, Machine Learning, NLP, Machine Vision, Generative AI), By Function, By End-Use, By Region, And Segment Forecasts, 2025 – 2030

<https://www.grandviewresearch.com/industry-analysis/artificial-intelligence-ai-market>

The size of the artificial intelligence market is expected to reach \$1.81 trillion by 2030, according to (Grand view research While the current size of the AI market is large, it is expected to grow more than 13 times over the next 10 years. During this forecast period, the AI market size is expected to increase at a CAGR of 35.9%.

The total annual profits of the global smart software market currently exceed \$126 billion, according to (omdia)



Source: Global Annual Report of the CompanyTH Software Markets(2018-2025)

<https://www.statista.com/statistics/607716/worldwide-artificial-intelligence-market-revenues/>

5-The impact of artificial intelligence on emerging economies

The impact of artificial intelligence on emerging economies is unique, combining opportunities and challenges:

- Opportunities:

- Overcoming traditional barriers: Emerging economies can leverage AI to bypass traditional manufacturing paths by directly applying AI solutions to areas such as agriculture, healthcare, and education.
- Global competitive advantage: AI-powered platforms can help small and medium-sized enterprises (SMEs) in developing countries access global markets.

-Challenges:

- Infrastructure Issue: The lack of advanced data infrastructure hinders the spread of AI in many developing countries.
- Brain drain: The global competition for AI talent disproportionately impacts emerging economies, often resulting in a loss of talent to developed countries.
- Policies that encourage equitable access to AI technologies and targeted investments in infrastructure will help these economies harness the potential of AI (Sarker, 2022).

The impact of artificial intelligence on market competitiveness

Artificial intelligence is increasingly recognized as a transformative force in global trade, impacting areas from supply chain management to trade finance. In this section, this framework provides a systematic approach to understanding how AI is impacting international trade. (Ozcan Ozturk, 2024) It offers solutions that facilitate operations, reduce costs, and increase overall efficiency. Market competition is a fundamental element in determining the ability of countries and companies to achieve economic growth and sustainability. Competition refers to the market's ability to attract

investment, achieve high productivity, and innovate products and services, while maintaining a balance of supply and demand in a healthy economic environment.

The competition is divided into:

National competitiveness: a country's ability to improve its economic environment to attract investment and enhance productivity.

- Institutional competition: The ability of companies to achieve superior performance compared to competitors in the same sector.

1-Factors affecting competition in global markets

Competition in markets is affected by several factors, the most important of which are:

- Innovation and technology: Highly competitive countries, such as the United States, Germany, and Japan, rely on innovation. Investing in research and development (R&D) increases the quality of products and services.

-Infrastructure: The availability of advanced infrastructure (roads, energy, communications) contributes to an improved business environment. Countries with modern ports and airports enjoy more efficient international trade.

- Labor market efficiency: A flexible labor market helps companies adapt to economic changes. The availability of skilled labor enhances productivity and competitiveness.

- Economic policies: Macroeconomic stability boosts investor confidence. Lower taxes and simplified government procedures encourage investment (Lawrence Emma, 2024).

- Trade openness: Increasing exports and imports enhances competition by encouraging trade exchange. Trade liberalization reduces costs and improves product quality.

- Market size: Countries with large markets (such as China and India) attract investors because of their large consumer base.

2-Global Competition Rankings

Countries are ranked according to competitiveness through reports such as:

- Annual Report of the World Economic Forum (WEF): Based on criteria such as innovation, labor market, and macroeconomic stability, in 2023, Switzerland, Singapore, and the United States topped the ranking.

- Global Competitiveness Report IMD: Focuses on corporate performance, government efficiency, and infrastructure.

Ranking of some Arab countries in the 2024 Government Artificial Intelligence Readiness Index (Rami El-Damiati, 2024):

- United Arab Emirates: The UAE topped the Arab world with a score of 75.66 points, demonstrating its comprehensive approach to AI.

- Saudi Arabia: Ranked second in the Arab world with 72 points, thanks to its massive investments in technology projects such as NEOM.
- Qatar: Ranked third in the Arab world with a score of 68 points, due to improved data management policies and capacity development in the public sector.
- Oman: ranked fourth in the Arab world with 62 points.
- Jordan: Advances to fifth place in the Arab world and 49th globally, with an increase in score from 56.85 in 2023 to 61.57 in 2024.
- Egypt: It has made significant progress, rising from 111th place in 2019 to 65th place in 2024, indicating its efforts to enhance its AI capabilities.
- Bahrain: ranked seventh in the Arab world with 54 points.
- Kuwait: ranked 8th in the Arab world with 51 points.
- Lebanon: ranked ninth in the Arab world with 46 points.
- Tunisia: ranked 10th in the Arab world with 43 points.
- Morocco: Ranked 11th in the Arab world and 88th globally, with a score of 43.34, indicating a decline in the Moroccan government's readiness for artificial intelligence.
- Iraq: Ranked 12th in the Arab world and 107th globally, with a score of 40.91 points, with sub-evaluations for the government index (32 points), the technology index (35.87 points), and the data and infrastructure index (54.25 points).

Globally, the United States topped the index with 87 points, followed by Singapore with 84 points, and then France with 79 points.

This index shows the disparity in countries' readiness to adopt artificial intelligence, and highlights the need to develop national strategies to enhance capabilities in this important field.

3-Strategies to enhance competition and stimulate innovation

By supporting scientific research and technology, improving the business environment by simplifying laws and procedures, developing education and training to raise the efficiency of the workforce, investing in infrastructure to support supply chains and trade, and promoting trade openness through new international agreements.

Countries and companies that adopt AI early gain a significant competitive advantage:

- Advantages of the first initiative: Countries like the United States and China are exploiting artificial intelligence to dominate strategic industries such as semiconductors, defense, and logistics.
- Sector Leadership: AI is enabling healthcare, automotive, and finance companies to redefine global industry standards.

But the race for competitive advantage is leading to increased geopolitical tensions. This requires the development of strategic policies to ensure balanced growth (Ramachandran, 2024).

4-Implications for global trade

The competition for AI leadership impacts global trade in several ways:

- Supply chain reorganization: Geopolitical tensions are pushing countries to localize their supply chains, reducing reliance on foreign AI technologies.

Data as a business asset: Countries with strong data systems gain a competitive advantage as data becomes a key resource for artificial intelligence.

Trade agreements: AI requires the inclusion of digital trade provisions in agreements, with a focus on data flows, intellectual property protection, and AI ethics.

5-Future trends in international competition in the field of artificial intelligence

It will continue the race for AI leadership is evolving, driven by technological advances and changing geopolitical priorities:

- Emerging players: Countries like India and Brazil are increasing their investments in AI to reduce their reliance on traditional powers.
- AI-Powered Multilateralism Organizations such as the World Trade Organization are likely to play a more important role in mediating AI-related trade disputes and promoting international cooperation.
- Technological convergence: The combination of artificial intelligence with emerging technologies such as computing and 5G will redefine the dynamics of global competition.
- While many expect widespread technological change as a result of AI, predictions about the speed and impact of innovations have been wrong. The trend towards controlling the resources required for the artificial intelligence industry is what they do not know, they are competing for it with Consider the opportunity cost of using it in other areas.
- Effective competition in the provision of AI services is likely to be important in ensuring that consumers and economies fully benefit from the technology.

6-Geopolitical Implications of AI-Driven Trade Policies

Integrating AI into trade policies has significant geopolitical implications:

- **The rivalry between the United States and China:** Trade policies increasingly reflect the competition for AI leadership, with both countries exploiting tariffs and technological restrictions to protect their strategic interests.
- **Regional trade alliances:** AI is strengthening regional alliances, such as the Comprehensive and Progressive Trans-Pacific Partnership (CPTPP), by promoting cooperation on digital trade.
- **Technology diplomacy:** Countries are using AI expertise as a diplomatic tool to negotiate favorable trade terms, influencing global power dynamics.

These geopolitical dimensions underscore the strategic importance of AI in shaping global trade policies.

Challenges and opportunities created by artificial intelligence in the market

Artificial intelligence presents opportunities and challenges for global trade and economic relations:

1- Opportunities

- **Increase productivity:** AI tools improve manufacturing and logistics efficiency.
- **Create a new market:** Artificial intelligence enables the development of innovative products and services, opening up new markets.
- **Enhancing resilience:** Artificial intelligence helps companies adapt to disruptions in global supply chains through predictive analytics.

2-Benefits of adopting artificial intelligence:

- The benefits of adopting artificial intelligence in small and medium-sized businesses are well documented. Research indicates that companies that implement AI technologies experience improved operational efficiency, reduced costs, and enhanced customer engagement.
- For example, SMEs that use AI to analyze data can discover valuable insights that inform strategic decision-making. This not only boosts productivity but also fosters innovation by enabling SMEs to develop new products and services tailored to market demands.
- Furthermore, AI's ability to personalize customer interactions significantly enhances customer satisfaction and loyalty, which are critical to long-term success.

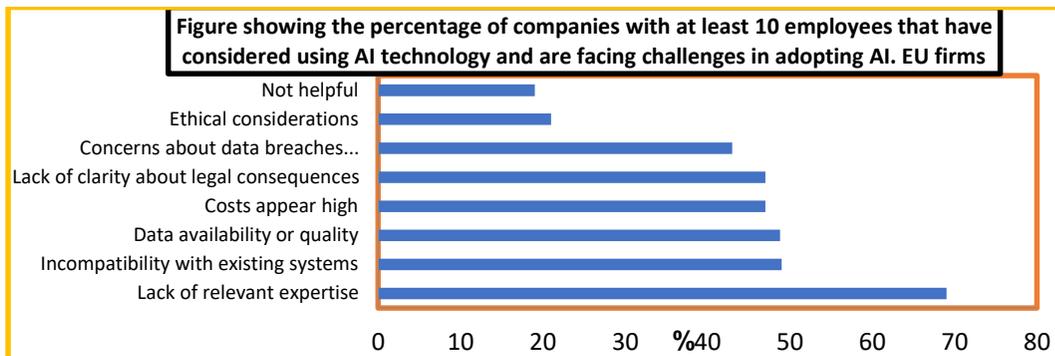
3- Challenges

- **Geopolitical tensions:** The race for AI leadership among countries like the United States, China, and the European Union is leading to fragmented policies and trade conflicts.
- **Labor market disruption:** Automation may displace workers, especially in routine tasks, while creating demand for highly skilled roles.
- **Organizational fragmentation:** The diversity in approaches to AI governance is hampering International cooperation in the field of data exchange, privacy, and intellectual property rights.
- **economic fluctuations** Such as inflation, financial crises, protectionist policies, the imposition of tariffs, climate change and its impact on production and supply chains, and political instability in some countries, which reduces the attractiveness of investment.

4-Implementation challenges:

- Despite the advantages but many small and medium-sized enterprises (SMEs) face significant challenges when adopting AI technologies. A common challenge is a lack of financial resources, as small businesses often struggle to invest in advanced technologies and attract talent.

- Additionally, there is a significant skills gap, as many SMEs lack the technically experienced staff needed to effectively implement and manage AI solutions. Resistance to change within organizational cultures can further complicate the adoption process, as employees may be reluctant to embrace new technologies or workflows (Grayson & Michael, 2024).



Source: Eurostat survey (2023) on ICT usage in enterprises [isoc_e] https://economy-finance.ec.europa.eu/document/download/10867a27-f49f-4aa9-89bb-feb752513f78_en?filename=dp210_en_artificial%20intelligence_0.pdf

Main Challenges in Using AI:

Companies face many problems when trying to use AI:

- Lack of skills (69%): Hard to find workers with AI experience.
- Old systems (49%): Current systems don't work well with AI.
- Poor data (48.8%): Not enough or low-quality data for AI.
- High costs (47%): AI is expensive, especially for small businesses.
- Legal concerns (47%): Unclear rules and laws around AI use.
- Data security (43%): Fear of data leaks or hacking.

Ethical issues (21%): Worries about fairness and privacy.

Among the challenges previously explained, there was a view on the part of the European Union to try to address these challenges. Policy intervention may be justified to remove barriers to AI adoption, because the net gains greater

- The development and use of AI, associated with learning effects, generates relevant cognitive effects and positive outcomes, leading to overall gains that increase as a greater proportion of companies engage in AI-related innovations and adopt its technologies.
- Moreover, learning effects contribute to amplifying and sustaining the advantage gains of early AI innovators and early adopters of AI solutions through self-reinforcing loops. This means that there are adoption barriers for small companies and newcomers, which can lead to suboptimal diffusion.
- Policies to stimulate AI innovation and diffusion must work simultaneously.

- Facilitating access to key infrastructure such as computing power and data and removing financial constraints that hinder intangible investments in AI capabilities for small businesses
- Develop the skills needed to develop and adopt AI and make it accessible to businesses, including by promoting knowledge sharing.
- Promoting the adoption of digital innovations Addressing the remaining fragmentation in the EU digital market, including with the aim of promoting the creation of new integrated datasets needed to train AI 90%

5- The economic impacts of artificial intelligence

- **can** the adoption of current AI systems is already having a tangible impact on productivity in the short term in a number of tasks and professions..
- Adopting AI solutions can theoretically enhance a company's productivity and the efficiency of specific tasks, by accelerating and improving decision-making, as well as by automating manual processes. (EIB, 2021). In particular, predictive AI is suitable for tasks such as targeted marketing, customer service, equipment maintenance, and service recommendations. By contrast, generative AI can be useful for calculations, automating routine tasks, assisting with writing, speaking, and translation, identifying patterns, and even simulating scenarios (such as simulating reactions to vaccines) (Simons, Turrini, & Lara Vivian, 2024).
- Recent engineering and consulting studies on specific uses of AI have reached similarly positive results. Thanks to AI, software engineers code twice as fast, similar to the speed observed in writing tasks. (Noy, Zhang 2023). Additional evidence suggests an average 14% increase in productivity in call centers and around 20% for economists. Overall, it is estimated that approximately 80% of jobs (in the United States) will have at least 10% of their tasks affected by AI, and that approximately 15% of workers' tasks could be completed faster without any compromise in quality. In the medium term, AI could also stimulate human capital through other channels, such as better-performing health and education systems. (Simons, Turrini, & Lara Vivian, 2024)
- One of these economic effects was that a positive correlation was found between reliance on AI Revenue growth a few years after its adoption within American companies, due to increased sales rates and employment, as worker productivity increased by 11% in California among American companies. This significant positive correlation does not apply to the use of AI specifically, but only to cloud computing, robotics, and specialized software. However, some studies have found a significant impact on productivity. For example, it was found that AI significantly increases the firm's productivity measured as sales, controlling for all other inputs to the production function (McElheran, 2024).
- Most studies exploring the relationship between AI use and productivity suffer from methodological or data limitations that prevent them from establishing a causal relationship. In this regard, However, the lack of evidence on the impact of AI on productivity may be

attributed to It takes longer to predict and incorporate into reality, However There is some evidence about the impact of generative AI applications on worker productivity.

6- A Ethical and regulatory considerations in global trade

Artificial intelligence raises ethical dilemmas, especially in areas such as:

- **algorithmic bias** Unequal access to AI tools and decision-making processes could exacerbate global inequalities.
- **Data sovereignty** Disputes over data governance and sovereignty highlight the need for harmonized regulations.

Global institutions such as the World Trade Organization have begun to address these challenges, by promoting AI governance frameworks that balance innovation and inclusion.

7- The strategic effects of supporting competitiveness AI for artificial intelligence

- The strategic implications of adopting artificial intelligence for small and medium-sized enterprises (SMEs) are profound. Research suggests that SMEs must develop comprehensive strategies that include not only technology acquisition but also employee training and organizational restructuring.
- Fostering a culture of innovation is essential to overcoming resistance to change and encouraging employees to engage with new technologies. Collaborative partnerships with technology providers or other companies can also facilitate knowledge sharing and access to resources, enabling SMEs to more effectively navigate the complexities of AI integration.
- In short, studies indicate that AI has the potential to significantly enhance the competitiveness of SMEs in the global marketplace. While the applications and benefits of AI are promising, the challenges associated with its implementation cannot be ignored. SMEs must adopt strategic approaches that address these barriers while fostering a culture of innovation and adaptability. Future research should focus on developing frameworks that guide SMEs in successfully integrating AI technologies, ultimately contributing to their sustainable growth and competitiveness in an increasingly digital environment.

Results and Recommendations

- Efficiency & Productivity: AI boosts manufacturing procedures and lowers operating expenses.
- Workforce Changes: Automation eliminates certain jobs while generating new ones in coding and data science.
- Company Competitiveness: Businesses that integrate AI become more inventive and flexible.
- Global Differences: Advanced nations gain more because of improved infrastructure and resources.
- Trade Implications: AI enhances supply chain effectiveness while sparking worries about market dominance.

- Ethical Issues: Concerns encompass data security, algorithmic partiality, and legal accountability.

Recommendations: The research suggests the following recommendations:

- National AI Plans: Nations ought to enact explicit policies to facilitate AI advancement.
- Training and Education: Emphasize digital competencies to ready the workforce.
- Public-Private Partnerships: Promote shared research and development initiatives.
- Regulatory Guidelines: Establish regulations for data safety, impartiality, and cybersecurity.
- Address the Digital Divide: Aid emerging nations with infrastructure and technology availability.
- Foster Innovation: Offer motivations for startups and AI-centered businesses.
- Just Economic Transformation: Create policies to help those impacted by technological transitions.

References

- Authority, S. D. (2022). "Autonomous Vehicles: Experiences and Challenges," .
<https://sdaia.gov.sa/ar/MediaCenter/KnowledgeCenter/ResearchLibrary/%D8%A7%D9%84%D9%85%D8%B1%D9%83% pdf>.
- AVICENA. (2024). *"The History of Artificial Intelligence"*. AvicenaTech Corp. ALL RIGHTS RESERVED, www.avicena.tech.
- BMC Software. (2024). *"Types Of AI With Examples"*. <https://blogs.bmc.com/artificial-intelligence-types/?print-posts=pdf>.
- Dave, M., & Nick, M. (2019). *"Artificial Intelligence: Short History, Present Developments, and Future Outlook"*,. p 14, https://www.ll.mit.edu/sites/default/files/publication/doc/2021-03/Artificial%20Intelligence%20Short%20History%2C%20Present%20Developments%2C%20and%20Future%20Outlook%20-%20Final%20Report%20-%202021-03-16_0.pdf : Report, Massachusetts Institute of Technology.
- Global, A. D. (2024). *Industry Trends and Forecasts to 2028*.
<https://www.databridgemarketresearch.com/ar/reports/%D8%A7%D9%84%D8%B3%D9%88%D9%82-%D8%A7%D9%84%D8%B9%D8%A7%D9%84%D9%85%D9%8A%D8%A9-%D9%84%D9%84%D8%B3 srsId=AfmBOop7K8>.
- Grayson, F., & Michael, G. (2024). *"Artificial Intelligence-Driven Competitiveness: Enhancing SME Performance in the Global Market"*. P8See discussions, stats, and author profiles for this publication at:<https://www.researchgate.net/publication/384442301>.
- Ian Ritchie. (2024). *"AI history"*, . <https://www.ritchie.studio/wp-content/uploads/2024/04/AI-history-2024.pdf>.

- Ibrahim, S. A. (2024). "The Impact of Artificial Intelligence and its Commercial Applications on Commercial Law (A Legal Study in Light of Its Nature, Types, Legal Applications, Commercial Uses, and Its Impact on the Rules of Commercial Law)". *Journal of Legal and Economic Studies – A Refereed Scientific Journal* , Volume 10, Issue 2, https://jdl.journals.ekb.eg/article_358827_2f20d40fc2aec9aace9f3a604ed1d680.pdf.
- Kounde Gavi. (2024). "The Role of AI in Enhancing Productivity and Efficiency in the Construction". p3 See discussions, stats, and author profiles for this publication at:<https://www.researchgate.net/publication/386507730>.
- Lawrence Emma. (2024). "The Future of AI: Trends, Challenges, and the Societal Impact of Artificial Intelligence". https://www.researchgate.net/publication/390236340_The_Future_of_AI_Trends_Challenges_and_the_Societal_Impact_of_Artificial_Intelligence.
- McElheran. (2024). "The econometric analysis in this paper does not seem appropriate to credibly establish a causal link, however.". <https://onlinelibrary.wiley.com/doi/10.1111/jems.12576>.
- OECD publishing. (2024). "ARTIFICIAL INTELLIGENCE, DATA AND COMPETITION". ,OECD ARTIFICIAL INTELLIGENCE PAPERS: https://www.oecd.org/content/dam/oecd/en/publications/reports/2024/05/artificial-intelligence-data-and-competition_9d0ac766/e7e88884-en.pdf.
- Olayiwola, B. A. (2024). "The Future of Artificial Intelligence: Trends and Predictions". CC BY-NC-SA 4.02024 https://www.researchgate.net/publication/385890167_The_Future_of_Artificial_Intelligence_Trends_and_Predictions.
- Ozcan Ozturk. (2024). Article *The Impact of AI on International Trade: Opportunities and Challenges*, MDPI, *ECONOMIES*, 2024, P4 *Economies* 2024, 12, 298. <https://doi.org/10.3390/economies12110298> <https://www.mdpi.com/journal/economies> .
- Ramachandran, A. (2024). "The Impact of Artificial Intelligence on Global Trade and Economic Relations: Transforming Markets, Policies, and Geopolitical Power". IBM Research - Thomas J. Watson Research Center Yorktown Heights, United States: https://www.researchgate.net/publication/386420668_The_Impact_of_Artificial_Intelligence_on_Global_Trade_and_Economic_Relations_Transforming_Markets_Policies_and_Geopolitical_Power .
- Rami El-Damiati. (2024). *Translation and analysis For the Arabic report, "An Overview of the Government AI Readiness Index,"*. Oxford: published by Oxford Insights, 7th edition, published on December 21 https://www.metaserv.me/academy/resources/guides/government-ai-readiness-index-2024-oxford-insights/?utm_source=chatgpt.com.

- Samah, M. H. (2024). "Applications of Artificial Intelligence and Development of History Curricula," . *Journal of the Faculty of Education, Alexandria University*, Volume 34, Issue 4, Part 2, https://journals.ekb.eg/article_393328_929e4019a959de728f2.
- Sarker, P. K. (2022). "Macroeconomic effects of artificial intelligence on emerging economies: Insights from Bangladesh." . *Economics, Management and Sustainability*, <https://jems.sciview.net/index.php/jems/article/view/151>.
- Sheikh, H. C. (2023). "Chapter 2 Artificial Intelligence: Definition and Background". *First Online*. Crossref DOI link:<https://doi.org/10.1007/978-3-031-21448-6.2>.
- Simons, W., Turrini, A., & Lara Vivian. (2024). "Artificial Intelligence:Economic Impact, Opportunities, Challenges, Implications for Policy". European Union: https://economy-finance.ec.europa.eu/document/download/10867a27-f49f-4aa9-89bb-feb752513f78en?filename=dp210_en_artificial%20intelligence_0.pdf.
- Size, A. A. (2024). Share and Industry Analysis, By Actuator Type (Linear Motion, Rotary), By Actuator Type (Hydraulic, Pneumatic, Electro-Electro-Mechanical, Electro-Hydraulic, Static), By Platform (Fixed Wing, Rotary Wing), By Installatio. <https://www.fortunebusinessinsights.com/ar/aircraft-actuator-market-102578> .
- Studies, I. o. (2021). "Artificial IntelligenceArtificial Intelligence," . *an awareness leaflet issued by the Institute of Banking Studies* (p. 2). a, State of Kuwait: <https://kibs.edu.kw/wp-content/uploads/2021/10/March-2021-Artificial-Intelligence>.