



THE ECONOMIC DIMENSIONS OF ARTIFICIAL INTELLIGENCE: ASSESSING THE READINESS OF THE ALGERIAN ECONOMY

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Abstract:

The study aimed to identify the most important economic dimensions of artificial intelligence, which has become a strategic priority for various countries, due to the economic gains achieved through its applications across multiple sectors. The study is divided into two main parts: a theoretical part in which we attempted to address all aspects of the subject by exploring the dimensions of the artificial intelligence economy, highlighting key concepts and its impacts on economic sectors; and an analytical part that examines the state of AI in Algeria. The study concludes that although there has been a noticeable improvement in terms of readiness and preparedness, Algeria still faces major challenges in adopting AI technologies, which hinders the desired economic development and future vision. Therefore, more efforts are needed to promote and integrate these technologies across various sectors.

Keywords: Artificial Intelligence; AI Technologies; Economic Development

JEL Classification: O32; O10; O33

Introduction:

In recent years, significant progress has been made in various fields of knowledge, alongside the emergence of technologies that have brought about radical transformations in numerous domains. Artificial intelligence (AI) stands out as one of the most prominent of these technologies due to its diverse

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applications and its role as the core of digital and technological transformation. It is a technology that simulates human behavior in thinking, problem-solving, learning, handling complex tasks, and decision-making.

On the other hand, Algeria is striving to keep pace with developments in artificial intelligence by implementing digitalization across various fields to achieve sustainable development. However, the use of AI in Algeria still faces challenges in being adopted as a tool for achieving the desired economic development.

1. Problem Statement: What are the economic effects of artificial intelligence? And where does the Algerian economy stand in relation to these technologies?

The problem of the study branches out into the following sub-questions:

- What is artificial intelligence, what is its importance, and what are its objectives?
- What are the effects of AI usage on economic sectors?
- How ready is the Algerian economy to benefit from AI technologies?

2. Study Objectives: The primary objective of this study is to answer the main research question. It also aims to:

- Define the concept, objectives, and types of artificial intelligence.
- Explore the economic impacts of AI across various sectors.
- Understand the current state of artificial intelligence in Algeria.

3. Study Hypotheses:

- First Hypothesis: Artificial intelligence, with its concept, importance, and objectives, has become a key element in the global economy.



- Second Hypothesis: AI technologies and applications have many positive economic effects in both the production and service sectors.
- Third Hypothesis: There is a noticeable improvement in Algeria's readiness and preparedness in the field of AI; however, many challenges remain in integrating AI technologies for practical use.

4. Methodology of the Study: This study relies on the scientific research approach using both inductive and deductive reasoning. The inductive approach involves reviewing literature related to artificial intelligence, while the deductive method involves extracting ideas previously formulated on the subject, and assessing the current state of AI in Algeria in terms of readiness and application.

5. Study Plan: In light of the importance of the study, and in order to answer its main questions, achieve its objectives, and test its hypotheses, the topic is addressed through the following three sections:

- Section I: The theoretical framework of artificial intelligence
- Section II: The effects of AI use on economic sectors
- Section III: The reality of artificial intelligence in Algeria

SECTION I: THEORETICAL FRAMEWORK OF ARTIFICIAL INTELLIGENCE

1. Definition of Artificial Intelligence: The concept of Artificial Intelligence (AI) refers to the simulation of human cognitive abilities. It is a subfield of computer science concerned with designing intelligent systems that exhibit characteristics associated with deep intelligence and various human behaviors (Badaro, 2013,p57) .

Artificial intelligence is the theory and development of computer systems capable of performing tasks that typically require human intelligence, such as visual perception, speech

recognition, decision-making, and learning under uncertainty (Tom, 2018).

It is also defined as a branch of computer science that provides a variety of methods, techniques, and tools to create models and solve problems by mimicking human behavior (Ocana-Fernandez, 2019, pp 536-568).

AI is a field of information systems with deep roots in decades of interdisciplinary research, given its goal of simulating human functions (Beccalli, 2020, 24).

Moreover, it is a field based on statistics and probabilities that is rapidly advancing through modern applications, seeking advanced programming methods to perform tasks and draw conclusions similar, to some extent, to human intelligence. Thus, it first seeks to define human intelligence and its dimensions, then attempts to simulate some of its properties (Alex, 2019, p34).

Consequently, the researcher concludes that there is no definitive definition of AI; rather, it is a field that mimics human intelligence and its capabilities. In today's world, AI is considered the "fuel of the age" as it emulates human thinking to autonomously make decisions and generate specific effects.

2. The Importance and Objectives of Artificial Intelligence:

2.1 Importance of Artificial Intelligence: The significance of artificial intelligence for business organizations lies in the following:

- Preserving expertise that may be lost due to retirement, disuse, or death.
- Storing information to create a knowledge base for multiple users or to serve as learning rules.
- Creating a technology that is not influenced by human emotions such as stress or fatigue, which makes it beneficial in consultancy and decision-making tasks.
- Eliminating routine and unsatisfactory tasks.



- Enhancing the organization's knowledge base by proposing solutions to specific and complex problems that might take a human a long time to analyze.
- Assisting in solving complex problems with multiple solution paths or no known solution methods, using traditional software, and storing them for future use.

2.2 Objectives of Artificial Intelligence: Artificial intelligence achieves several key objectives, the most important of which are (Al-Saeed, 2022, pp 452-474):

- Understanding the complex mental processes that the human brain performs during thinking, and translating them into corresponding computational processes to enhance the computer's ability to solve complex problems.
- Understanding the nature of human intelligence by creating computer programs capable of mimicking intelligent human behavior-meaning the ability of a program to solve a problem or make a decision based on a given scenario. The program itself determines the best approach to solve the problem or reach a decision using various reasoning operations it contains. This marks a significant shift that goes beyond traditional information technology, bringing reasoning closer to the human method.
- Enabling machines to process information in a manner that closely resembles how humans solve problems.

3. Types of Artificial Intelligence: Artificial intelligence can be classified based on its areas of application into the following types (Simon, 2018, pp 199-215):

3.1 Narrow AI (Weak AI): This type is designed to perform specific tasks within a limited domain. It specializes in one area only. For example, virtual assistants in chat programs or interactive voice response systems.

3.2 General AI (Strong AI): This type can perform tasks with a level of cognitive ability similar to that of humans. It focuses on

enabling machines to think and plan independently, much like human cognition. Examples include self-driving cars, automated parking systems, and autonomous insurance systems.

3.3 Super AI: This refers to a hypothetical form of AI that surpasses human intelligence and is capable of performing tasks better than humans. However, this concept remains purely theoretical and does not yet exist in our current era.

4. Artificial Intelligence Technologies: Artificial intelligence consists of six major technologies, which are (Abdullah M, 2023):

4.1 Machine Learning: A core AI technology that uses algorithms to learn from data. It is applied in various areas such as facial recognition, natural language processing, and autonomous vehicles.

4.2 Neural Networks: This technology enables computers to learn by mimicking the human brain's structure. It is used in applications like image recognition, natural language processing, and self-driving cars.

4.3 Expert Systems: These are AI systems that allow computers to make decisions based on a set of rules. They are used in applications such as medical diagnosis, financial analysis, and legal consulting.

4.4 Computer Vision: This enables computers to interpret and understand images. It is used in facial recognition, object detection, and image classification applications.

4.5 Natural Language Processing (NLP): An AI technology that allows computers to understand and process human language. It is used in applications such as chatbots, voice recognition, and text analysis.

4.6 Robotics: This involves designing machines that can perform tasks independently. Robotics is applied in industries such as manufacturing, healthcare, and autonomous vehicles.



5. Challenges of Artificial Intelligence: The application of artificial intelligence faces several challenges, including:

A. Technical Challenges (Stephan De Spiegeleire, 2017,p259):

- **Lack of Resources:** Many small organizations and institutions face a shortage of both financial and human resources.
- **Weak Digital Infrastructure and Poor Internet Connectivity:** Many areas lack the proper digital infrastructure and reliable internet access needed to effectively implement AI technologies.
- **Data Issues:** AI algorithms struggle with incomplete or poor-quality data. Additionally, algorithms rely on data and assumptions that can be incorrect or biased, leading to inaccurate results.

B. Professional Difficulties:

- **Wide Range of AI Solutions:** There are many AI solutions available, making it difficult to choose the most suitable one for specific fields.
- **Customer Impact:** The use of AI tools, like chatbots instead of customer service representatives, can affect customer satisfaction.
- **Reluctance from Decision-Makers:** Some decision-makers are not yet convinced of the importance of using AI technologies at present.
- **Shortage of Skilled Workers:** There is a lack of qualified personnel with expertise in AI.
- **Lack of Support from Management:** Companies may lack technical expertise and support from higher management to implement AI.
- **Inadequate Data Quality:** The data available to employees may not be of sufficient quality for effective use in AI applications.
- **Privacy Concerns:** Collecting data for AI may lead to violations of individuals' privacy and rights.

C. Social Challenges:

- Job Displacement: AI applications pose a threat to jobs currently held by humans.
- Criticism of Non-AI-Dependent Organizations: Organizations that do not use AI in their decision-making may face criticism, as well as those that rely too heavily on technological outputs.

D. Ethical Challenges:

- Data Privacy: The data fed into AI algorithms must remain confidential.
- Bias in AI: There is a potential for bias due to errors in data or incomplete datasets.
- Privacy and Ownership Issues: AI may breach privacy boundaries and misuse data.
- Profit-Driven AI: The pursuit of profit as the primary goal of AI can lead to harmful consequences.
- Dependence on Large Tech Companies: Most AI applications rely on funding from major tech companies like Google, which exposes them to control over ethical standards by these corporations.

SECTION II: THE EFFECTS OF ARTIFICIAL INTELLIGENCE ON ECONOMIC SECTORS

1. AI in the Agricultural Sector: Artificial intelligence plays an increasingly important role in agriculture by enhancing efficiency and productivity through various applications. Below are its main uses, supported by recent statistics:

- Precision Agriculture: AI enables farmers to use drones and sensors to monitor crops and land with high accuracy. This helps gather sufficient data on crop conditions, allowing for more informed decisions regarding irrigation and fertilization. For example, in the United States, precision farming technologies



have increased productivity by 4%, with an additional 6% potential if broadly adopted (Mansour, 2018,p17).

- **Crop Forecasting and Water Management:** AI analyzes weather and soil data to estimate daily irrigation needs and predict crop yields. It is also used to improve water management efficiency. In Kenya, for example, farmers using AI-based tools like Virtual Agronomist receive personalized fertilizer recommendations, significantly increasing grain yields.
- **Pest and Disease Control:** AI can quickly analyze images and data to detect pests and diseases early. It is estimated that 20% to 40% of crops are lost annually due to pests, and smart technologies can greatly reduce this percentage.
- **Agricultural Robots:** AI-powered robots are used for planting, harvesting, and data collection. This reduces the need for labor and improves accuracy and speed. For instance, GPS-equipped tractors can steer themselves, operate machinery, and identify field boundaries to maximize productivity.
- **AI in Agricultural Supply Chains:** AI also improves agricultural supply chain management by forecasting demand, optimizing storage, and reducing waste to increase overall efficiency.
- **Market Growth:** The AI market in agriculture is projected to grow significantly. In 2024, it is expected to reach USD 2.08 billion, with a compound annual growth rate (CAGR) of 22.55%, reaching USD 5.76 billion by 2029.

In summary, AI is revolutionizing the agricultural sector by increasing productivity, enhancing efficiency, and promoting sustainability through a wide range of applications.

2- The Use of Artificial Intelligence in the Industrial Sector: Artificial intelligence plays a key role in advancing industry. It helps improve efficiency, reduce costs, and enhance product quality. Here are its main uses, supported by recent statistics:

- **Predictive Maintenance:** AI is used to analyze machine data and predict breakdowns before they happen, which reduces unexpected downtime. A study showed that AI-based predictive maintenance helped cut downtime by up to 50% (Stephan Schlogl, 2019,p260).
- **Quality Control:** Problems in products are detected during production using computer vision. This area has helped reduce defects by 99% in some large factories.
- **Smart Robots:** These robots, equipped with AI, are used to carry out dangerous and repetitive tasks, increasing productivity and reducing human errors. Currently, statistics show that 24% of manufacturing companies use AI in production assembly and quality testing.
- **Supply Chain Management:** AI improves supply chain performance by providing better inventory planning and improving demand forecasting, leading to cost reductions. AI applications in this field could increase productivity by 40% and improve profits by 20% by 2035.
- **Product Design:** AI is used to analyze data and compare possible outcomes, which helps reduce the time spent on improving product designs and increases their market availability.

Furthermore, it is expected that the global AI market will reach \$1.8 trillion by 2030, reflecting the rapid spread of these technologies across various industries. These figures show that AI is a key factor in boosting competitiveness and innovation in industry.

3- The Use of Artificial Intelligence in the Energy Sector: The importance of artificial intelligence in energy is growing, as it is involved in many processes, helping with production forecasting, increasing consumption, and reducing costs. Here's how AI is changing the energy sector:



- **Energy Production Forecasting:** AI is used to analyze weather data and location information to improve the accuracy of energy production forecasts from renewable sources like wind and solar power. This helps in better planning for energy production and reduces operating costs associated with the fluctuations in renewable energy production.
- **Improving Energy Consumption Efficiency:** By analyzing data from smart grids, AI can predict energy consumption patterns, allowing electricity companies to manage demand and distribution effectively, reducing waste. It can also be used to analyze electricity consumption behavior in homes, buildings, and industries, identifying opportunities to improve energy efficiency.
- **Reducing Energy Production Costs:** AI helps increase the efficiency of energy production processes, thereby lowering costs. For example, it can be used to manage the performance of power plants and desalination plants, improving efficiency and cutting expenses. Moreover, AI can instantly optimize energy consumption, leading to a reduction of up to 25% in energy costs.

Through these technologies, the energy sector can achieve greater efficiency, reduce costs, and promote sustainability.

4- The Use of Artificial Intelligence in the Healthcare Sector:

The role of artificial intelligence (AI) in healthcare is growing, contributing to the improvement and development of medical services. Here are some of the key uses of AI in this field:

- **Medical Data Analysis and Diagnosis:** AI algorithms, especially those based on "deep learning," are used to analyze complex medical data, helping to diagnose diseases with high accuracy.
- **Drug and Treatment Development:** AI helps speed up the process of discovering new drugs by analyzing large amounts of biological and chemical data, reducing the time and cost involved in developing treatments.

- **Personalized Healthcare:** AI can analyze genetic information and other health data to create personalized treatment plans for each patient, enhancing the effectiveness of medical care.
- **Improving Patient Experience:** AI is used to automate administrative tasks, such as handling admission forms and gathering data, easing the burden on patients and improving their overall experience within the healthcare system.
- **Remote Monitoring and Care:** AI technologies allow for remote patient monitoring, which helps in early detection of health changes and providing timely care.
- **Digital Health Platforms:** Platforms like "Altibbi" are examples of how AI is used for online medical consultations, providing services such as measuring vital signs using a phone camera to make healthcare more accessible. Startups are using smart technologies to innovate every step in patient care, such as Enlitic, which develops deep learning applications to improve diagnostic accuracy, and Oncora Medical, which uses AI to assist oncologists in creating personalized radiation therapy plans for cancer patients (Elflein, April 30, 2020).

In short, AI helps improve the efficiency and quality of healthcare by enhancing diagnosis, innovating treatments, and offering personalized care.

5- The Use of Artificial Intelligence in the Education Sector:

AI is growing rapidly in the education sector, positively impacting its quality and adaptability to the diverse needs of students. Here are some notable examples of AI applications in this field:

- **Assisting Teachers with Their Educational Tasks:** AI tools help reduce the administrative burden on teachers by managing student data, tracking attendance, and evaluating student performance in exams. This allows teachers to dedicate more time and effort to core teaching activities.



- **Adaptive Learning:** AI can analyze student performance data and preferences, then create personalized study plans and tests tailored to each student's strengths and weaknesses, improving the learning experience and supporting student engagement.
- **Universal Accessibility:** AI helps make classrooms accessible to all, including students who speak different languages or have visual or hearing impairments, by providing customized and integrated solutions.
- **Automating Administrative Tasks:** AI can handle administrative tasks such as grading tests, freeing up valuable time for teachers to focus on other aspects of teaching.
- **Innovating New Educational Tools:** Many AI-powered educational tools have emerged, helping teachers design lessons, communicate with parents, and provide customized learning experiences for students. Examples include "Edcafe AI" and "MagicSchool AI," which offer a wide range of services for teachers.

By using these technologies, teachers can enhance the quality of education and provide more personalized and effective learning experiences for students.

6- The Impact of Artificial Intelligence on Economic Growth:

- **Doubling GDP:** By improving efficiency, AI contributes to cost reduction and increased production through automation and predictive maintenance. It also drives innovation by designing new products and services based on large data analysis and machine learning applications.
- **Creating Premium Job Opportunities:** AI drives job creation by hiring experts in algorithm engineering, big data analysis, and research and development in smart technologies.
- **Strengthening Competitive Advantage:** Companies become more competitive through constant innovation and AI adoption,

attracting foreign direct investments and boosting international trade exchanges.

Digital Evidence of AI's Contribution to Growth (ENCC):

- **Economic Growth Forecasts:** AI is expected to contribute to a 1.2% annual increase in global economic growth by 2030.
- **Sectoral Impact Study:** The use of AI varies across sectors, with the highest levels in financial services and manufacturing.
- **Impact on Personal Income:** The growing demand for skilled labor leads to higher personal income, and the increased profits in advanced industries are reflected in higher salaries.

7- The Impact of Artificial Intelligence on the Economic Well-being of Communities: AI significantly contributes to enhancing the economic well-being of communities through various mechanisms:

- **Boosting Productivity and Economic Growth:** AI helps improve efficiency in production processes, leading to increased output and reduced costs. This improvement supports economic development and raises living standards (Mckinsey, 2018).
- **Creating New Jobs:** Despite concerns about job losses due to automation, AI is creating new jobs that require advanced technological skills, increasing employment opportunities (Nawzad, 2023,p15).
- **Improving Quality of Life:** AI applications in fields like healthcare and education improve services and raise the standard of living in society.
- **Supporting Innovation and Technological Progress:** AI is a key driver of innovation, contributing to the development of new products and services, thus enhancing economic competition (Rkia, 2024,p32).

Additionally, challenges related to AI implementation should be considered, such as the need to develop workers' skills to keep up



with technological advances and ensuring the fair distribution of the economic benefits generated by these technologies.

Section III: The State of Artificial Intelligence in Algeria:

1. The Algerian National AI Plan: Recently, Algeria began digitizing and updating its data, contributing to the development of AI systems similar to those in other countries. In 2018, the government decided to create a national AI strategy for 2020-2030. The AI market is expected to reach a value of \$160.10 billion by 2023, contributing 25.5% to global GDP, or around \$13 trillion in the future. To take advantage of this opportunity and join global AI programs, the Minister of Higher Education and Scientific Research launched Algeria's AI strategy on December 7, 2019, in Constantine. This strategy focuses on enhancing national capabilities in training, education, and scientific research. AI will also support economic development and provide the social and economic sectors with tools to overcome digital transformation obstacles. The strategy's discussions, led by over 200 stakeholders, were presented by experts in AI. This includes a white paper on the social strategy for implementing AI and practical approaches for improving education, healthcare, transport, and energy through innovation.

2. Efforts Made by Algeria in AI:

A. Creation of the AI Center (SKAILAB) (Center., 2025): In February 2020, SKAILAB was established at the University of August 20, 1955, in Skikda. This center is the first of its kind in Algeria, focusing on AI. The center aims to offer solutions to industrial partners and provides training for experts in IT and AI. Its objectives include:

- Establishing partnerships with various sector players.
- Collaborating with company managers to gather data and expertise.
- Collecting, coding, and filtering data.

- Developing AI models that suit the available data.
- Training university researchers and business owners in AI.
- Implementing, testing, and spreading developed models.
- Helping users express their needs in terms of management models and decision support.

B. The National Higher School of Artificial Intelligence (ENSIA): It was established in 2021 by Presidential Decree No. 323-21 (Decree, 2021). The school specializes in training engineers in artificial intelligence and data science and aims to ensure that graduates become skilled professionals capable of adding value to the national economy and finding innovative solutions in sectors such as health, energy, agriculture, and transport. The establishment of ENSIA aims to perform tasks and responsibilities in higher education, scientific research, and technological development in its area of expertise.

C. Establishment of the Higher School of Mathematics (ENSM): To enhance AI tools in Algeria, the Higher School of Mathematics started its educational programs on October 12, 2021. Its objectives include (Mathematics, 2025):

- Training high-level engineers in mathematics.
- Providing support to major companies in Algeria.
- Offering postgraduate training (Ph.D.) and leading in scientific research.

Figure (01): The potential of Algerian resources in the field of artificial intelligence



Source: (Ali, 2025) <https://ae.linkedin.com/posts/alikahlane>



3. National AI Strategy in Algeria: In December 2024, Algeria announced its National AI Strategy, aiming to integrate this technology into various sectors and boost technological innovation.

• **Objectives of the Strategy:**

-Enhancing Research and Workforce: By establishing specialized bodies such as the "National School of Artificial Intelligence" and increasing the number of AI labs at universities and research centers.

- Supporting Startups: Providing aid and facilities to startups to encourage innovation in AI.

- Building Data Centers: Developing robust infrastructure to support AI applications and data storage.

-Prioritizing Sectors: Directing efforts towards areas such as security, agriculture, industry, and health, for AI solutions.

- Supporting Projects and Initiatives: Launching the "High-Performance Computing Center" to provide advanced computing capabilities for researchers and startups, facilitating the development of AI applications across sectors.

- Establishing Skill Development Centers and Investment Fund: To support and enhance skills and technological innovation in Algeria.

With this strategy, Algeria aims to reduce dependence on imported solutions and develop local solutions, thus enhancing its digital sovereignty and positioning itself as a leader in AI in Africa.

4. Available Technological Infrastructure for AI in Algeria:

A. Digital Infrastructure:

• Internet and Connectivity: Algeria has made significant improvements in its internet infrastructure but still faces challenges with speed and coverage in some areas. AI relies on

large amounts of data and fast connections to run applications effectively. Although Algeria has launched projects to enhance internet access in remote areas, these steps are still in progress. In some remote regions, internet speeds are still slow, which is a barrier to AI applications that require high-speed connections, such as big data and cloud computing. However, there is continuous development of wireless networks through 4G and preparations for 5G technologies.

B. Data Centers: Algeria has started building large facilities for data processing and storage to support the analysis of massive data, which is crucial for AI applications. However, its capacity to handle big data is still limited compared to leading countries. Algeria is also working on building advanced data centers to support cloud computing, which is fundamental for AI. One example is the launch of a High-Performance Computing Center in the capital to store massive data and support scientific research.

C. Scientific Research and Development: Algeria is developing AI research through educational bodies and universities. Some specialized laboratories in this field have been established. For instance, the National Higher School of Artificial Intelligence was founded to train the necessary talents for this sector.

D. Joint Research: There is growing interest in collaborative research, especially integrating AI into vital projects like energy and healthcare, with funding and support initiatives like the Scientific Research Investment Fund.

In 2023, Algeria launched a National AI Strategy to enhance the role of scientific research and support it through increased investments in research centers.

E. Education and Training: Academic programs and training centers are being set up to equip students and workers with the skills needed for AI. For example, some Algerian universities offer specialized postgraduate programs in AI.



F. Universities and Academic Programs: Algeria has begun integrating AI into its academic programs at prominent universities such as the University of Algiers, Constantine University, and Tlemcen University. Additionally, the establishment of the National School of Artificial Intelligence is a significant step in developing specialized academic skills. However, academic programs in this field are still limited compared to the growing demand, and curricula may be outdated or insufficient in covering modern technologies. Despite these efforts, the number of AI experts remains limited, which poses a challenge to the widespread adoption of this technology.

5. Challenges Facing the Use of Artificial Intelligence in Algeria: The adoption of artificial intelligence in Algeria faces a range of challenges that are distributed across legislative, technical, human, and economic aspects, including:

5.1. Lack of a Comprehensive and Integrated Legal Framework: Although Algeria has enacted regulatory laws for artificial intelligence, including Law 07-18 of June 10, 2018, on personal data protection, which guarantees privacy and fundamental rights, this law remains insufficient unless followed by practical measures. The issue of data breaches in Algeria is minimal due to the software used, which is easy to hack. Additionally, there is a lack of legislation on AI ethics, user protection, and the legal responsibility of machines and smart software. This is further exacerbated by the slow pace of updating existing laws to keep up with the rapid technological developments.

5.2. Limited Digital Infrastructure: Algeria faces limited digital infrastructure due to insufficient investment in technologies essential for AI development. The country lacks stable broadband networks, secure data centers, and advanced computing systems, along with weak high-speed internet coverage and low investment in cloud and supercomputing. These shortcomings hinder AI progress and are worsened by a

shortage of specialized expertise. According to a 2022 UNESCO report, AI investment in Algeria remains inadequate to achieve the desired technological advancement (Eddine, 2023,p22).

5.3. Lack of Competence and Human Skills: This challenge is characterized by a lack of specialized AI training in Algerian universities, brain drain due to limited local opportunities, and the weak connection between academic institutions and market needs.

5.4. Low Societal and Cultural Awareness: Algerian institutions have yet to fully grasp AI technology due to several factors, including a shortage of trained professionals, limited familiarity with its applications, and reliance on outdated software. There is also a lack of trust in AI, with concerns about job losses and privacy issues. Moreover, insufficient awareness campaigns and challenges in adopting digital transformation, especially in traditional sectors, further hinder AI integration.

5.5. Ethical and Security Issues: There is a lack of a clear framework to ensure transparency and fairness when using algorithms, with risks of unethical use or discrimination in AI decisions (especially in critical areas such as the judiciary or healthcare), along with weak mechanisms for protecting data and personal information. To make AI applications beneficial and more effective, several conditions must be met, such as high levels of security and trust for users, as well as transparency. These requirements are crucial in various applications, such as security surveillance systems, military applications, safety-critical systems, medical diagnostics, and other important applications.

5.6. Cybersecurity Challenges: Algeria, like many other countries, faces difficulties in cybersecurity, a fertile ground for weaknesses due to the uses of this technology. Therefore, AI must be employed to protect it. Algeria's inability to control AI technologies, particularly with the rise of cyber warfare that

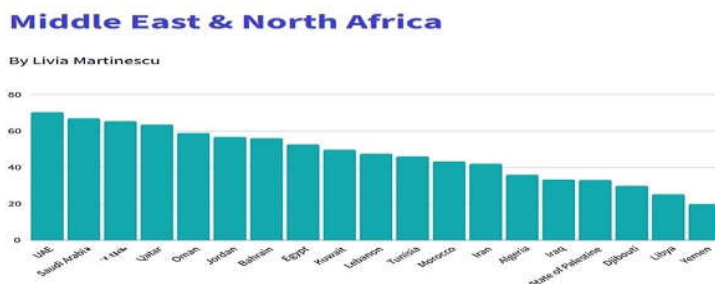


disrupts electronic services and infrastructure systems, remote automated attacks using drones, and online fraud and misinformation campaigns, all pose threats to public interests and national security, especially given external tensions at Algeria's land and sea borders with Libya, Mali, Niger, and Morocco (Mansour, 2018).

5.7. Weakness of Algerian Economic Companies in AI Development: The spread of AI in Algeria, or anywhere else in the world, is inevitable. However, the role of Algerian companies, especially in the industrial sector, in using AI is very limited, almost nonexistent. While AI is present in the industrial sector, it is confined to meeting rooms and absent from production lines. Failure to use AI in the industrial sector will cause Algerian companies to miss the opportunity to increase productivity and enhance competitiveness. This, in turn, will drive demand for AI talent, which will encourage training and talent development in AI.

Overall, Algeria can meet the challenges associated with adopting artificial intelligence (AI) as a means of achieving sustainable development, thanks to the political will it has demonstrated to support this field. Additionally, Algerian companies have begun to pay increasing attention to and invest in AI, reflecting a clear interest in developing this technology. Algeria possesses significant data potential, a key resource for AI. According to a report by Oxford Insights, Algeria ranked 14th regionally out of 20 countries in the Middle East and North Africa in terms of its readiness to adopt AI technologies. It received an overall score of 35.99, divided between 30.10 in the government index, 30.56 in technology, and 47.30 in data and infrastructure, as shown in the following figure:

Figure (02): Algeria's ranking in terms of AI readiness
According to the 2023 Global AI Readiness Index for Africa



Source: (Nathan Benaich, 2023)

Conclusion:

The study aimed to assess the extent to which the Algerian economy is prepared to benefit from artificial intelligence (AI) technologies. The findings indicate that Algeria has made some progress in this field, particularly in terms of planning and moving toward building human resources and infrastructure, alongside initiatives related to the regulatory framework. However, Algeria faces significant difficulties in implementing AI technologies, which hinders the desired economic development and the future vision for the period 2020-2030. Despite the available potential, the lack of specialized human resources and weak infrastructure are the main obstacles.

The study concluded the following key points:

- AI represents a qualitative leap in both theoretical and applied sciences. It mimics human cognitive abilities and thought patterns in certain processes such as perception, reasoning, as well as learning, knowledge acquisition, and skills development, through different and continually evolving AI systems.
- AI contributes to providing numerous opportunities to achieve sustainable development goals, as its technologies offer modern solutions, better risk assessments, and clearer projections.



- The use of AI in the economic sector improves service quality and enhances competitiveness.
- The Algerian legislative system is weak in terms of providing adequate legal regulation for AI.
- Many industrial and economic companies still use outdated technologies in their operations and service delivery, overlooking the importance and benefits of AI in achieving progress and development.
- Algeria lags significantly behind other Arab countries, such as Egypt and Saudi Arabia, in the adoption and use of AI applications.

Based on these findings, the study suggests the following recommendations and proposed solutions to achieve development through AI:

- Plan and implement programs to develop human resources and support new companies in the field of AI.
- Strengthen technological infrastructure by improving and enhancing the effectiveness of networks, with the goal of advancing Algeria and adopting AI systems and applications.
- Invest in human resources to build capacities by redirecting current education towards sciences related to AI systems and technologies.
- Enact the necessary laws, regulations, and frameworks in Algeria to manage AI technologies.

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