



Artificial intelligence as a mechanism to drive and promote economic cooperation for Africa's inclusive sustainable Development

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Received: 12/10/2025

Accepted: 08/11/2025

Published: 04/12/2025

Abstract:

The study aims to Highlighting the role of AI in achieving the Sustainable Development Goals by enabling economic cooperation across the continent African Through Digital Technologies and Innovations which allows Shortcut the route and time on Africa to reach and accelerate sustainable development. In this study, we found that Artificial Intelligence a strategic choice to build an economy Integrated Strong sustainable and inclusive with the ability to drive economic cooperation on the African continent by enabling companies, governments and individuals to work together more effectively. The research suggests that AI presents a tangible opportunity for enhanced regional cooperation and sustainability, though this potential is contingent upon addressing significant infrastructure and policy challenges.

Key Words: Economic Integration, Sustainable Development, Artificial Intelligence, Africa, Gross Domestic Product (GDP), Economic Growth.

JEL Classification : O33, O55, F15, Q01.

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Introduction :

Africa is strategically of great importance in terms of vital and strategic reserves of energy and natural resources of all kinds, in addition to the importance of the African continent in that it is considered a promising consumer market and a stimulus for global powers, in addition to the human element, which are important elements that make Africa receive the attention of the major powers and turn in many stations into an arena of competition and conflict. In light of globalization and the rapid changes that the world is witnessing today, economic cooperation and integration among African countries has become a necessity for external conditions, and the interest in this cooperation and integration has been more evident for developing countries, which have seen economic cooperation among themselves as an appropriate solution to the problems faced by the movement to build the national



economy. At the level of the African continent, it can be said that it has a long history with experiences of cooperation and integration. There is no doubt that Africa has all the elements of a balanced economy that enables it to achieve the free trade area effortlessly, the strategic importance that the African continent has gained in the past few years for a number of world powers, especially China, the United States of America and Russia, to enter into a competition arena to reserve a foothold for them in order to achieve their interests and open prospects for them to achieve the greatest amount of gains. The African continent is the second largest continent in the world after Asia, with an area of about 30 million km², which constitutes about 20% of the world's land area. Africa is home to about 800 million people, representing about 15% of the world's total population, and has vast natural resources and vast resources that are mostly underinvested.

The African continent derives its importance from the fact that it constitutes the world's strategic reservoir of natural resources, raw materials and precious stones, which are under intense pressure in light of the intense competition between the major countries consuming these resources following the increase in global demand and the shrinking of the proportion of global reserves and production rates in other places and regions of the world. Given this context, the potential of Artificial Intelligence to serve as a catalyst for intra-African cooperation and development warrants detailed investigation.

Research Problem : This research addresses the following core problem: Can Artificial Intelligence effectively facilitate economic cooperation in Africa to achieve the seventeen Sustainable Development Goals? This question arises from the need to leverage technological innovation to overcome persistent developmental challenges

Research Hypotheses: The research is based on the following two hypotheses:

- The adoption of artificial intelligence in the African continent will have a significant positive impact on economic cooperation, which leads to the achievement of comprehensive sustainable development as well as reaching the structural transformation of countries.
- The successful integration of AI into African economies is a strategic imperative, not merely a choice, for achieving competitive advantage and structural transformation in the global digital economy.

Importance of the research: The importance of the study lies in raising a very important topic, which is how to reach economic cooperation and achieve sustainable development through the adoption and exploitation of artificial intelligence in the continent of Africa.

Research Objective : It is to clarify and show how important artificial intelligence and its secretions are in economic cooperation. Highlighting the role of digital technologies and innovations in shortening the road and time for the continent of Africa to reach and accelerate sustainable development.

Research Methodology : Descriptive Approach: This involves describing the concepts and the current state of affairs. The article does this extensively by defining



key terms like Artificial Intelligence, Economic Cooperation, Economic Integration, and Sustainable Development.

Analytical Approach: This involves examining the relationships between these concepts. The article analyzes how AI can enable economic cooperation and how it can contribute to achieving each of the 17 Sustainable Development Goals.

I. Artificial Intelligence, Economic Cooperation and Sustainable Development:

1. Artificial Intelligence:

The Rise of Intelligence Artificial In the 1950s, the term was first used during a university conference. "Dartmouth" (Dartmouth) on intelligence Artificial Since 1956, innovators and researchers have published 1.6 million publications related to intelligence Artificial They filed patent applications for about 340,000 intelligence-related innovations Artificial (Ahmed Awad, 2021)

The roots of research on artificial intelligence go back to the forties of the last century with the spread and use of computers, and the attention at the beginning of the fifties focused on neural networks, and in the sixties, research activity began to turn towards systems based on knowledge representation, which continued to be worked during the seventies, and with the beginning of the eighties, there was a great leap in artificial intelligence research, and the history of artificial intelligence can be summarized during the twentieth century. It can be said that the roots of artificial intelligence go back to the beginning of the 1940s when some scientists proposed a model of artificial neurons, and the concept of artificial intelligence emerged in a big way at the beginning of the 1950s when the British scientist Alan Turing raised the question of the extent to which a machine can think, and since that time artificial intelligence has witnessed waves of prosperity and stagnation until it reached the widespread spread that we are witnessing today in various fields.

1.1. Concept of Artificial Intelligence:

Although the term artificial intelligence has emerged since 1956, and its technologies have spread more recently, there is still no uniform definition that is widely agreed upon, due to the difficulty of defining what human intelligence is as well as what artificial intelligence is, in addition to the different perspectives that can describe artificial intelligence .

Intelligence (Intelligence) is the sensitive part of the ability to achieve goals, and its degrees and types vary between humans, animals, and machines, at first, the goal of intelligence programs was to replace the expert in the specialization of programs, but this proved impossible, and the goal of intelligence programs became to help the expert perform his work quickly and efficiently (Nasser, 2004, p. 14)

As for intelligence Artificial Known by Copeland and Broadfoot (1993, Copeland & Proudfoot) as "the process of developing computer systems so that they are able to perform tasks that typically require the use of human intelligence, such as visual perception, speech recognition, decision-making, and translation (Abdel Moneim & Ismail, 2021, p. 7)

Marvin Lee Mensek knew him. Marvin Lee Minsky)) as the construction of computer programs that engage in tasks that are satisfactorily accomplished by



humans, because they require high-level mental processes such as cognitive learning, memory regulation, and critical thinking. (Musa & Bilal, 2019, p. 20)

Artificial intelligence has also been defined as certain behaviors and characteristics of computer programs that make them mimic the mental abilities of humans and their working patterns, the most important of which is the ability to learn, deduce, and react to situations that are not programmed in the machine (Abdul Rahman, 2018, p. 17)

AI also refers to systems that exhibit intelligent behavior by analyzing their environment and taking actions with a certain degree of autonomy to achieve specific goals (Boucher, 2020, p. 4)

In addition, AI has been considered as a way to make a computer, a computer-controlled robot, or a program that thinks intelligently, in the same way that intelligent humans think (Musa & Bilal, 2019, p. 20)

But given the most applications that exist today, AI can be defined as: systems that use technologies that are capable of collecting data and using them to predict, recommend, or make decisions with varying levels of autonomy and choose the best action to achieve specific goals (SDAIA, 2022)

Finally, it can be said that If A lot of theoretical definitions of AI revolve around: the ability of a machine to behave like humans or perform actions that require intelligence. But the definition of the concept has evolved at the same pace as technological development to be the meeting point between all modern definitions is to try to imitate intelligent human behavior. And maybe Stand at four types of intelligent systems. Systems that think like humans; systems that behave like humans; systems that think rationally; systems that act rationally (Ahmed Awad, 2021, p. 4)

Some also see artificial intelligence as a science that is a branch of the computer, others see it as a computer application, others see software as providing artificial intelligence, while others believe that a machine can do this, and there is a lack of stability in the concept because it is still developing to this day and this science produces many related sub-sciences .

Despite these differences in concepts, the following features of AI can be observed based on the previous definitions:

- Artificial intelligence is concerned with machine simulations of human intelligence and skill.
- Preparing software and hardware.
- Considering it as a branch of computer science.

Therefore, the main goal of AI is to simulate human intelligence using sophisticated software to solve atypical problems or train them to solve them.

1.2. Types of Artificial Intelligence:

Artificial intelligence can be classified according to its capabilities into three levels as follows:

- **Artificial Intelligence:** It is used to describe the process of developing artificial intelligence to the point where the ability of a thought machine is greater than that of humans to accomplish certain tasks.



- **Powerful Artificial Intelligence ((Strong Artificial Intelligence (strong AI):** It is a term used to describe the process of developing artificial intelligence to the point where the ability of a thought machine is functionally equal to that of a human. Powerful AI states that a computer can be programmed to be a human mind, to be intelligent in every sense of the word, to have cognition, beliefs, and to have other cognitive states that are usually only attributed to humans, and includes the following key characteristics: the ability to think and interact intelligently, solve puzzles, make judgments, plan and learn, communicate as it should have, awareness of thoughts, objectivity, feelings, and behavior. (Musa & Bilal, 2019, pp. 28-29)

- **Weak AI (Weak Artificial Intelligence (Weak AI):** Narrow or weak intelligence systems have specific intelligence that mimics intelligent behavior in a specific area, such as the "intelligent personal assistant" app SIRI From Apple, the app employs the internet as a powerful database to answer users' spoken questions, and have a conversation with real people, but it works in a very narrow and predetermined way, and this is evidenced by the inaccurate results you get when you make conversations that aren't programmed to respond to them (Musa & Bilal, 2019, p. 29)

Although applications based on weak AI are specialized in certain tasks, they are good at their specific tasks, and examples of this are the robots used in the manufacturing process that are very intelligent due to the accuracy and the fact that they perform very complex actions that may seem incomprehensible to the average human mind.

2. Economic Cooperation:

Economic cooperation is an ancient international approach and a tool for overcoming obstacles to international relations, but the term integration did not exist in the literature that appeared before 1942, although there are some manifestations of it in reality, such as the Treaty of Methuen between Britain and Portugal in 1703, and the German Customs Union "Zollverein" in 1834.

We will try to present the concepts of integration and international economic cooperation and exposure to the various concepts that abound in the economic literature that dealt with the subject of international trade, and the traditional school is considered one of the most important schools that have considered the field of foreign trade, and its pioneers are Adam Smith and Ricardo, and recently we will discuss the methods of integration and definitions formulated by contemporary thinkers, headed by J. Viner in his analysis of the effects of trade under the customs union.

However, there are many studies that do not differentiate between the concepts of cooperation, complementarity and joint action, while others emphasize the need to differentiate between these concepts.

Although it is difficult to define and control the terms accurately in economics, there is a lot of literature that differentiates between these concepts, which we will try to adopt in this study.



2.1. The Concept of Economic Cooperation:

It is well known that international economic cooperation aims at the development of international economic relations, and therefore all voluntary agreements between contracting countries are considered cooperative relations. Cooperation, then, is the removal of barriers or some of them in international economic relations, which may take an informal form, such as cooperation between non-governmental organizations. (Hanish, 2009, p. 3)

2.2. Forms of Economic Cooperation:

- **Institutional economic cooperation:** This type of cooperation is under the supervision and management of independent international bodies and institutions, and the aim is to organize and achieve stability in a specific international sector, and the most important well-known manifestations of this cooperation are:

- The World Trade Organization;
- International Monetary Fund;
- Arab Monetary Fund.

- **Bilateral Economic Cooperation:** It is represented in all bilateral agreements between two countries for the purpose of overcoming the obstacles and obstacles faced by their relations.

- **Multilateral economic cooperation:** It includes the development of relations for more than two countries.

- **Regional Economic Cooperation:** This type of cooperation includes a group of countries that are geographically and regionally convergent.

2.3. Types of Economic Cooperation:

International economic cooperation varies depending on the Contracting Parties or Collaborators, in general, three types of economic cooperation can be distinguished International: (Hanish, 2009, p. 4)

- **Cooperation in accordance with common economic interests:** that is, all cooperating parties have economic advantages gained from the process of economic cooperation.

- **Solidarity cooperation:** It is between countries that have national relations such as language, religion, common history, etc., and these relations are characterized by the fact that they are often one-way and on easy terms.

- **Politically conditional economic cooperation:** cooperation between international parties coupled with political agreements and conditions of one of the parties, such as the Euro-Mediterranean Partnership.

Consequently, the forms and forms of economic cooperation vary according to the goals and objectives of the cooperating countries.

We also conclude from the above to formulate the following definition:

Economic cooperation is the procedure - whatever their nature - that aims at coordination between two or more countries in order to remove or reduce obstacles to the development of inter-economic relations and includes all forms of joint inter-regional action.



3. The Concept of Economic Integration

3.1. Definition of Economic Integration:

Although the meaning of integration is clear from a linguistic point of view, which means that the separate parts are interconnected to complement each other, from an idiomatic point of view, there are difficulties in controlling the term on the part of many economic pioneers, due to the view of each party of the nature and goals of the integration process or the stages required by the path of transition to economic unity.

The following are some of the most important definitions formulated by the pioneers of integrative thought:

- **Gunnar Myrdal Definition:** It is the social and economic process that removes all barriers between different units, and leads to the achievement of equal opportunities for all elements of production nationally and regionally.
- **Definition of Bela Balassa:** Here social integration excludes equality in the remuneration of the elements of production and believes that integration means eliminating the causes of discrimination between economic units and enterprises, and between the economies of the countries of the bloc as well.
- **Peter Robson's definition:** In addition to Balassa, he believes that economic integration is the best way to achieve international economic relations and the effort to remove obstacles to such cooperation.
- **Definition of Salvation:** Believes that economic integration is not an end in itself, but a means to achieve the goals of the Union.
- **F. Machlup's definition:** He argues that the idea of full complementarity involves actually taking advantage of all the possible opportunities offered by an efficient division of labor.
- **Pindier's definition:** Economic integration is defined as the removal of separations between the economic policies of member states, in order to create and implement common policies, and it is noted that this definition applies to the maximum degree of integration.
- **Definition of Marer and Monties:** They define it as the freedom of movement of goods, services, labor, capital, and technology between common countries.

From the above, it can be said that most of the definitions that targeted a concept have commonalities, and accordingly we formulate the following definition:

Economic integration aims to achieve economic integration between two or more countries, according to stages aimed at gradually removing obstacles to the movement of goods, services, people and capital, leading to the coordination of economic and social policies and their subordination to a supranational authority.

We also conclude that there is a distinction between economic cooperation and economic integration, where integration can be considered as the highest degree of economic cooperation, as integration completely eliminates the obstacles that hinder the development of bilateral relations.

We also point out that economic blocs are the applied case of the concepts of integration, i.e., each group of countries enters a stage of integration and practices an economic bloc.



3.2. Integration Success Factors:

a- Political will: Political will is the first condition that must be met before initiating any complementary approach between the parties wishing to form an economic union, given that political will is the main guarantor to face any possible obstacles to economic unity, in addition to being the final reference for any future disputes between the members who make up the union.

Political will should not be limited to a state's declaration of its acceptance to join the economic unity, but must also be reflected in the quality of the decisions and the seriousness of the contributions that result from that State in advancing the path of unity.

Political will is also manifested in the extent to which the member state accepts the obligation to submit to the supranational authority that is formed in the advanced stages of economic unity, where the member state has the only option of abiding by the decisions of the Union authority or withdrawing and thwarting the entire project.

b- Availability of the pillars of unity and integration: The process of integration and integration between a group of countries requires the availability of some elements that are considered as a driving factor and strengthening the efforts of the comprehensive unity, the most important of which are the availability of at least some of them, to ensure the success of the integration process. (Hanish, 2009, p. 7)

b1- National Elements: The most important of which are language, religion and belonging, as they are among the strong pillars for the success of the integration process and cooperation in general, as it facilitates communication between the members of the economic community and makes them more willing to sacrifice for the success of the integration process, and the sense of common belonging to one nationality facilitates the integration process and strengthens the acts of solidarity and sharing. The costs of passing to the comprehensive unity, provided that the weak political will does not restrain these popular forces and cancel their impact on the ground by restricting their freedom and restricting the margins of their freedom, areas of activity and contributions.

b2- Cultural and social components: Unified cultural pillars facilitate the strengthening of the factors of economic unity, through the contribution of the intellectual elites in explaining the advantages of unity and its repercussions on all members of the same nation.

Social traditions and common customs also play a pivotal role in the process of integration and unification, not only through the support of the segments of society, but also in the expansion of production and consumption processes that are subject to similar behaviors in terms of demand and consumption structures in society.

b3- Abundance of natural and economic resources: The availability of material, human and natural resources is an important and necessary factor in strengthening and accelerating the stages of the integration process, which provides constructive advantages for trade, the movement of goods and services, and the increase in intra-regional investments, thus the growth of the economies of the blocs and the achievement of the welfare of their peoples.



b4- Availability of the infrastructure for advanced transportation and communications: It is obvious that the greater the degree of development of the transportation and communications infrastructure, the more this will lead to an increase and ease of the movement of goods and services and the movement of people within the borders of the bloc, thus reflecting on the development and well-being of communities within the economic grouping, in addition to the reflection of the whole matter on the speed of traffic and the transition to the final stages of integration.

b5- Political freedoms and democracy: Political stability plays an important role in supporting unity and integration, and the democratic climate and the expansion of the margin of political freedoms contribute to highlighting the real positions of the forces of society, including parties, associations and civil society, on integration issues, as well as contributing to clarifying the views and reservations of the active elites in the societies concerned with integration, and thus all of this is ultimately reflected on the integration process, in terms of reviewing shortcomings or valuing the gains in a way that serves the interests of the nation in a fair manner. Political and democratic society enables to give the opportunity to civil society in its various components to express its aspirations, opinions and orientations towards unity, thus contributing constructively to the evaluation of the different stages of the integration process, in order to avoid jumping on reality and serving political purposes and the interests of limited groups of close associates, which hinders the integration project and loses its collective meaning.

3.3. Organizational and Technical Framework of the Integration Project:

The process of economic integration requires the availability of scientific, legal and regulatory frameworks represented by: (Hanish, 2009, p. 9)

a- Scientific background: Serious, and in-depth field studies and researches are considered as the real reference in the development of policies and strategic plans for the economic integration project, and therefore the success or failure of these plans depends on the seriousness of those researches and studies, because the closer they are to reality, the more it is possible to control the deviations resulting from the field application of cooperation and integration mechanisms.

b- Legal frameworks: These are the legal basis for the integration process, where collective inter-regional agreements and decisions issued by collective political and economic bodies are considered as the legal reference in the application of integration mechanisms.

c- Organizational structures: It directly supervises the various stages of the integration process, and its role is mainly manifested in the following elements:

- Framing and organizing the unitary work in accordance with the agreements and laws signed between the member states.
- Managing and managing administrative affairs in its various components and distributing tasks for the optimal use of the human and financial energies and resources approved for the unitary project .
- Adopting the principle of specialization in the supervision of organizations in the various sectors of joint cooperation, in order to avoid overlapping powers.



4. Sustainable Development:

4.1. Definition of Sustainable Development:

The term sustainable development first appeared in a publication issued by the International Union for the Protection of the Environment (IUCEP) in 1980, but it was only after it was reused in the 1987 report of the United Nations World Commission on Environment and Development (WECD), under the auspices of then-Prime Minister of Norway, Gro Harlem Brundtland.

The acceptance of the term by the United Nations General Assembly gave it some political significance, and in turn led to the development of the principles of sustainable development during 1992 by key leaders and decision-makers at the United Nations Conference on Environment and Development (WCED) in Rio de Janeiro, Brazil. Many definitions of sustainable development have been developed in different ways, but the widely used definition is based on the Report on Our Common Future, which was published during the Brundtland Commission in 1987, and the Brundtland Report defined sustainable development as development that meets the needs of the present without compromising the ability of future and future generations to meet their needs. (Mubarak, 2016, p. 14) (Skolos & Malotidi, 2006, p. 13)

The FAO Conference defined sustainable development as the management and conservation of the resource base and the guidance of the process of biological and institutional change in a way that ensures that the human needs of present and future generations are continuously met in all economic sectors, does not lead to environmental degradation and is characterized by technical and acceptable nature.

It is also defined as the commitment to the establishment of an equitable global society that recognizes the need to ensure the human dignity of society, where peace, stability, respect for human rights and fundamental freedoms, including the right to development and respect for cultural diversity, are represented. (Development, 2002)

4.2. Sustainable Development Goals:

Sustainability has become a school of thought that has spread around the world since the Earth Summit in 1992, and sustainability for humans can be defined as the ability to preserve the quality of life you live in the long term, and this in turn depends on the conservation of the natural world and the responsible use of natural resources, and the term sustainability has been used since the 1980s, and it was first used in the sense of human sustainability on the planet, so that this paved the way for the most common definition of sustainability and sustainable development, as it was defined as development that meets the needs of the time present without compromising the ability of future generations to meet their own needs.

On 25 September 2015, the 193 Member States of the United Nations adopted the Sustainable Development Goals (SDGs), which are the goals of the 2030 Agenda for Sustainable Development, also known as the Global Agenda, and is considered a new vision and global role model for action to eradicate poverty, protect the planet and ensure peace and prosperity for all peoples by 2030.



- Emphasizing the end of poverty and hunger in all its forms and dimensions and ensuring that all human beings can realize their potential within a framework of dignity and equality and in a healthy environment .
- The Sustainable Development Goals (SDGs) are designed to protect the planet from degradation, including by sustaining consumption and production, managing the planet's natural resources sustainably, and taking urgent action on climate change so that it can support the needs of current and future generations.
- One of the core areas of the SDGs is to ensure that all people enjoy a prosperous life that meets their aspirations, and that economic, social and technological progress is achieved in harmony with nature.
- One of the key pillars of the Sustainable Development Goals is the promotion of peaceful and just societies in which everyone has room for them and societies free from fear and violence. There can be no sustainable development without peace, nor can peace be achieved without sustainable development.

It is important to mobilize the means to implement the 2030 Agenda for Sustainable Development by revitalizing the Global Partnership for Sustainable Development, based on a spirit of strengthened global solidarity, with a particular focus on the needs of the poorest and most vulnerable, with the participation of all countries, all stakeholders and all peoples.

II. The Role of Artificial Intelligence in Achieving Development Goals:

The United Nations' 17 Sustainable Development Goals (SDGs) represent the world's commitment to achieve ambitious global gains for people and the planet by 2030 and by eradicating poverty and promoting inclusive economic growth to reducing maternal mortality, achieving literacy and numeracy for all, and doubling the productivity of smallholder farmers, future global development is inextricably linked to the use of artificial intelligence and big data.

AI could contribute up to US\$15.7 trillion to the global economy in 2030, more than the current GDP of China and India combined. Of this amount, US\$ 6.6 trillion will be derived from increased productivity and US\$ 9.1 trillion from the spillover effects of consumption. The total impact of the Africa and Asia Pacific markets will be expected to be US\$1.2 trillion. By comparison, the 2019 GDP for all countries in sub-Saharan Africa was US\$1.8 trillion. Thus, the successful deployment of AI and big data would open up a world of opportunities for developing countries.

1. The Relationship of Artificial Intelligence to Economic Cooperation:

- AI can support economic cooperation by enabling better supply chain management. AI-powered technologies such as predictive analytics can be used to improve supply chain operations, reduce costs, and improve efficiency. For example, AI can be used to predict demand for goods and services, enabling businesses to manage their inventory more effectively and avoid inventories.
- AI can enable businesses to collaborate more effectively. AI-powered technologies such as chatbots and virtual assistants can be used to facilitate communication between companies, allowing them to share information, negotiate deals, and



collaborate on projects. For example, AI can be used to identify potential business partners and facilitate introductions between them, reducing the time and effort needed to find and communicate with potential collaborators.

- AI can support economic cooperation by enabling cross-border trade. AI can be used to automate customs clearance processes, reducing the time and costs associated with cross-border trade. For example, AI-powered technologies such as blockchain can be used to enable safe and efficient cross-border transactions, reduce the risk of fraud and increase the speed and reliability of trade.

- AI can support economic cooperation by enabling better resource management. AI-powered technologies such as satellite imagery and drones can be used to monitor natural resources and identify areas that need conservation efforts. This can help ensure sustainable resource management, reduce the risk of resource conflicts, and enable businesses and local communities to work together to manage natural resources more effectively.

- AI can support economic cooperation by enabling better access to finance. AI-powered technologies such as credit scoring algorithms can be used to assess creditworthiness more accurately, enabling businesses and individuals to access financing more easily. For example, AI can be used to assess the creditworthiness of small and medium-sized enterprises, which are often underserved by traditional banks.

- AI can support economic cooperation by enabling better supply chain management. AI-powered technologies such as predictive analytics can be used to improve supply chain operations, reduce costs, and improve efficiency. For example, AI can be used to predict demand for goods and services, enabling businesses to manage their inventory more effectively and avoid inventories.

2. Relationship of Artificial Intelligence to the Achievement of the Sustainable Development Goals:

In 2015, the United Nations General Assembly approved seventeen goals, which it considered a comprehensive plan for development and a better life for the world, which must be completed by 2030, so that artificial intelligence is considered one of the most complex and impressive human innovations, however, the current debates about its applications and effects on society and various businesses, remain difficult to grasp all its future impacts and various dimensions, especially on the Sustainable Development Goals. (Belasal & Amroush, 2022, p. 1163)

2.1. Goal 1: No Poverty

A significant challenge is the lack of reliable data to identify and map impoverished populations, especially in informal settlements, for targeted aid. AI can analyze high-resolution satellite imagery and mobile phone data to map poverty hotspots in near real-time, enabling governments and NGOs to direct social programs and resources more effectively to the most vulnerable communities.

2.2. Goal 2: Zero Hunger

Smallholder farmers, who produce most of Africa's food, are highly vulnerable to unpredictable weather, pests, and soil degradation. Concretely, AI-powered mobile



apps can deliver hyperlocal, real-time advisories to farmers' phones on optimal planting times, pest control measures, and personalized fertilizer recommendations, directly boosting yields and resilience

2.3. Goal 3: Good Health and Well-being

There is a critical shortage of specialized healthcare professionals, particularly in rural areas, leading to delayed diagnoses. For example, AI-based diagnostic tools can analyze medical images like chest X-rays for tuberculosis or retinal scans for diabetic retinopathy, enabling community health workers to provide specialist-level screenings in remote clinics.

2.4. Goal 4: Quality Education

Overcrowded classrooms and a lack of personalized support lead to high dropout rates and poor learning outcomes. AI-driven adaptive learning platforms can tailor educational content to each student's pace and level of understanding, helping to bridge learning gaps in foundational subjects like literacy and numeracy, even in resource-poor schools.

2.5. Goal 5: Gender Equality

Women entrepreneurs often face a significant finance gap due to biases and a lack of traditional collateral. AI-powered alternative credit scoring can analyze non-traditional data (e.g., mobile money transactions, utility bill payments) to assess the creditworthiness of female-led SMEs, increasing their access to capital and financial inclusion.

2.6. Goal 6: Clean Water and Sanitation

Many African cities lose 30-50% of their treated water due to leaks in aging and unmonitored pipe networks. AI algorithms can analyze data from acoustic sensors and flow meters to pinpoint the exact location of leaks in a water distribution system, enabling utilities to perform pre-emptive repairs and dramatically reduce non-revenue water.

2.7. Goal 7: Affordable and Clean Energy

Over 600 million people in Africa lack reliable electricity access, and grid extension to remote areas is costly. AI can optimize the operation of mini-grids powered by solar energy, forecasting local energy demand and managing battery storage to provide reliable, 24/7 power to isolated rural communities.

2.8. Goal 8: Decent Work and Economic Growth

A large informal sector and skills mismatches hinder the creation of stable, formal employment. AI-powered job matching platforms can connect African youth with formal sector opportunities by analyzing their skills via digital profiles and matching them with employers seeking specific competencies, thereby reducing underemployment.

2.9. Goal 9: Industry, Innovation, and Infrastructure

Predictive maintenance of critical infrastructure like railways and power plants is often reactive, leading to costly downtime. AI can enable predictive maintenance by analyzing sensor data from machinery to forecast failures before they occur, allowing for scheduled repairs that minimize disruption to industrial and transport infrastructure.

**2.10. Goal 10: Reduced Inequality**

Marginalized groups, including those in remote regions, often lack access to formal financial services, perpetuating economic inequality. AI-driven fintech applications can provide these populations with access to digital banking, microloans, and insurance products via mobile phones, directly fostering financial inclusion and reducing economic disparities.

2.11. Goal 11: Sustainable Cities and Communities

Rapid urbanization leads to severe traffic congestion and inefficient public transport systems. AI-based traffic management systems can analyze real-time vehicle flow data to optimize traffic light sequences and public bus schedules, significantly reducing commute times and urban pollution.

2.12. Goal 12: Responsible Consumption and Production

Post-harvest losses for perishable goods like tomatoes and fruits can exceed 50% due to poor storage and market linkages. AI can optimize cold chain logistics and predict market demand, helping farmers and distributors reduce food waste by ensuring produce is stored correctly and routed to markets where it is most needed.

2.13. Goal 13: Climate Action

Small-scale farmers are disproportionately affected by climate change but lack access to affordable insurance. AI can power index-based insurance, where payouts are triggered automatically based on AI-analysis of satellite data for specific climate events (e.g., drought, flooding), providing a safety net for vulnerable farmers.

2.14. Goal 14: Life Below Water

Illegal, Unreported, and Unregulated (IUU) fishing depletes the fish stocks that coastal communities rely on. AI can analyze satellite and vessel tracking data to identify suspicious fishing vessel behaviors in real-time, enabling authorities to patrol more effectively and protect marine conservation zones.

2.15. Goal 15: Life on Land

Poaching and habitat loss threaten iconic species like elephants and rhinos. AI-powered camera traps and acoustic sensors can automatically identify poachers or logging trucks in protected areas and alert ranger patrols instantly, enhancing conservation efforts.

2.16. Goal 16: Peace, Justice and Strong Institutions

Judicial systems are often backlogged with cases, leading to long pre-trial detentions and delayed justice. AI tools can assist judges by rapidly analyzing case files and legal precedents, helping to streamline court procedures and reduce the time to resolve routine cases.

2.17. Goal 17: Partnerships for the Goals

Siloed data between government agencies, NGOs, and researchers hinders effective collaboration on development projects. AI can facilitate data collaboration platforms that allow different stakeholders to jointly analyze anonymized datasets—for example, on disease outbreaks or crop yields—while preserving privacy, thereby enabling more effective, data-driven partnerships.

**Conclusion:**

The research touched on highlighting the role of artificial intelligence in achieving the Sustainable Development Goals by enabling economic cooperation across the African continent through digital technologies and innovations that allow shortening the road and time for the continent of Africa to reach and accelerate sustainable development. At the end of this research, we reached a set of results and suggestions, which are as follows:

Results:

The analysis confirms that AI holds significant potential to drive economic cooperation and sustainable development in Africa. Key findings indicate that:

- AI's primary value lies in optimizing systems—from supply chains to resource management—thereby creating efficiencies that form the foundation for stronger intra-African economic ties.
- However, the continent's potential to harness this "AI dividend" is severely constrained by a pervasive data gap, inadequate digital infrastructure, and a lack of cohesive policy frameworks. This risk exacerbating existing inequalities, both between nations and within populations.
- Realizing the SDGs with AI requires a targeted approach that addresses Africa's unique challenges, such as its predominantly informal economies, infrastructure deficits, and vulnerability to climate change, rather than applying generic solutions.

Suggestions:

- Develop AI-Focused Infrastructure: Prioritize investments in reliable electricity, internet connectivity, and cloud computing resources to form the foundational bedrock for AI applications. Public-private partnerships are crucial for funding and managing this infrastructure.
- Foster AI Innovation in Key Sectors: Launch targeted initiatives and funding for AI solutions in high-impact sectors like agriculture (e.g., predictive analytics for crop yields), healthcare (e.g., diagnostic tools for remote areas), and financial services (e.g., AI-driven credit scoring for SMEs). This moves beyond a generic industrial focus to a technology-enabled growth strategy.

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