منتدى الاستراتيجيات الأردني
JORDAN STRATEGY FORUM

Towards Effective Governance of Artificial Intelligence: A Look at International Figures and Models

May 2025

Knowledge is Power

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JORDAN STRATEGY FORUM

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The JSF also offers a rare opportunity and space for the private sector to have evidence-based debate with the public sector and decision-makers with the aim to increase awareness, strengthening the future of the Jordanian economy and applying best practices.

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@JSFJordan

/JordanStrategyForumJSF

Jordan Strategy Forum

Amman, Jordan
T: +962 6 566 6476
F: +962 6 566 6376

Knowledge is Power: A report that presents some facts, figures, and observations from different sources on a specific topic.

To evaluate the study

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1. Introduction

In today's fast advancing technological landscape, the term Artificial Intelligence (AI) has become a buzzword. From pattern recognition, solving complex problems, language comprehension and translation, data analysis, and self-driving cars, the impact of AI has become universal.

AI spans across almost all socio-economic activities including healthcare, finance, education, security, manufacturing, energy and oil and gas, public sector, and others. As it continues to evolve, AI promises to bring significant advancements in **creativity, innovation, and efficiency**.

A recent research report by the **International Data Corporation (IDC)**, titled *"***The Global Impact of AI on the Economy and Jobs in 2024***,* "indicated that the cumulative global economic impact of business spending on AI applications—aimed at improving operations, services, and commercial products—is **estimated to reach approximately $19.9 trillion by 2030**. Additionally, estimates suggest that **every dollar spent in 2023 on AI-driven solutions contributed to generating $4.6 in the global economy**.

Notwithstanding the potential of AI, technology can also raise important ethical and other considerations / risks. For example, as technology becomes more pervasive, the use of personal data by AI systems raises privacy concerns.

The overall objective of this Knowledge is Power report, published by the Jordan Strategy Forum (JSF), is to outline the **emerging approaches to regulating AI systems worldwide**.

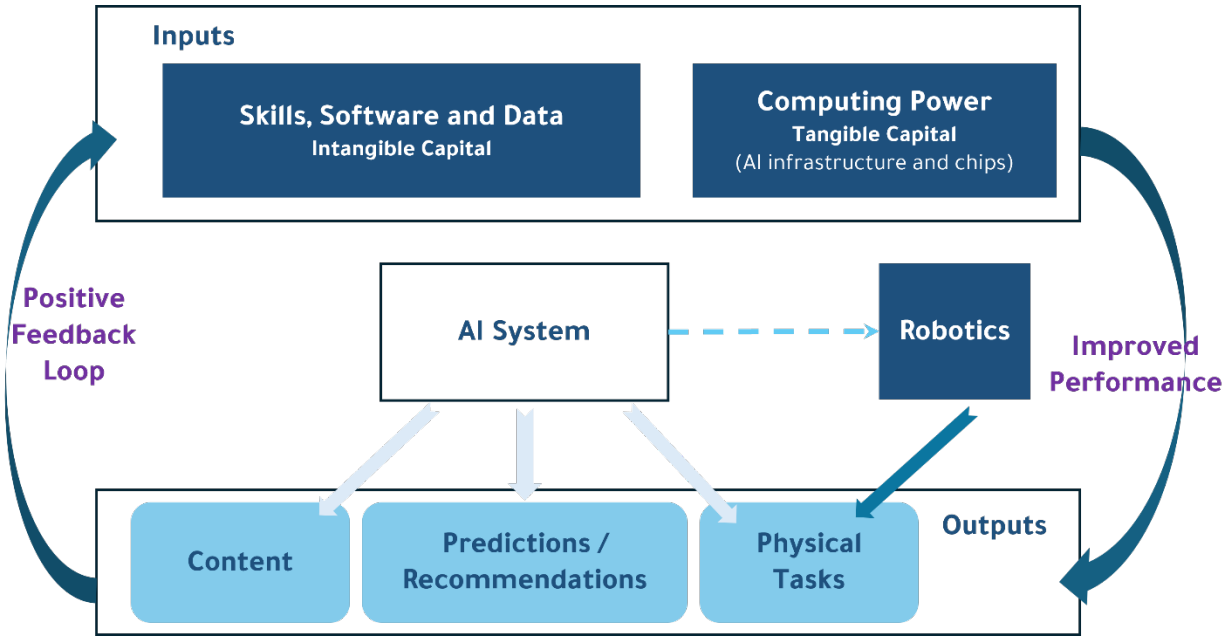
- **Definitions of key issues** related to AI systems.
- **Informative statistics** about AI.
- **Challenges** of AI that must be addressed (need for regulation)
- **Emerging regulatory approaches worldwide**.
- **Policy recommendations**.

2. Artificial Intelligence: Definitions of Key Terms

AI Systems are computational systems that "process data and information in ways that resemble intelligent behavior, typically involving elements such as reasoning, learning, perception, prediction, planning, or control[1]. AI systems are types of production technologies which rely on **inputs** and produce **outputs**.

1. Inputs: AI systems rely on both **tangible and intangible inputs**. The primary intangible inputs are the skills of specialists, including IT engineers, programmers, and data scientists. These skills are applied to develop the software (AI models), which in turn require additional input, most importantly, data. In addition, the software and data depend on **tangible infrastructure** such as computers, their capacity, the power of the chips used (semiconductors), and communication systems.

Inputs and Outputs in AI Systems



Source: Artificial Intelligence Papers / Organization for Economic Co-operation and Development (OECD) / April 2024.

[1] UNESCO Recommendations on the Ethics of Artificial Intelligence, 2022.

2. Outputs: Outputs are the results of tasks performed by AI systems, such as content generation and decision-making based on complex predictions. When AI systems are integrated with robotics, they can also perform physical tasks, such as autonomous vehicle driving. In analyzing AI outputs, it is essential to distinguish between **generative AI** and **non-generative AI**.

Non-Generative AI relies on algorithms to extract information from large datasets in order to identify patterns, predict outcomes, and support decision-making. The most prevalent techniques in this type of AI are **Machine Learning (ML)** and **Deep Learning**, which branches from ML.

On the other hand, **Generative AI** systems are designed to produce final content, such as texts, images, videos, and sounds, in response to natural language queries and requests. Key technologies for generative AI include **Large Language Models (LLMs)**, such as **ChatGPT**.

As shown in the previous diagram, AI systems have a **"positive feedback-loop"** for self-improvement (**machine learning**). Self-improvement can occur by "optimizing and finetuning the model parameters without yet changing the basic design of the AI model itself". However, "there is a distinct future possibility of a more fundamental self-improvement of AI that creates a new AI model. In other words, AI-generated successive AI models may deviate from the goals and intentions of the initial human-designed AI model". [2]

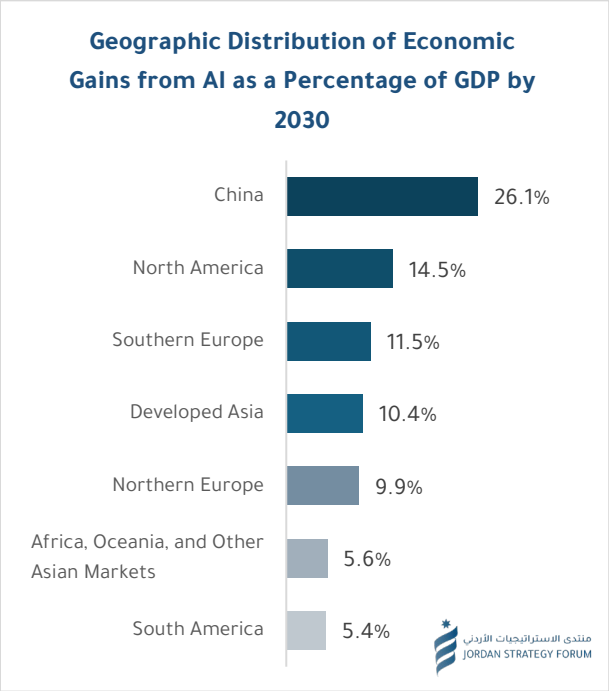
Therefore, it is essential to control or regulate the functioning of AI systems to ensure they stay aligned with their intended goals and to minimize the risks of deviations. This requires regulating the development process and establishing clear legislation and laws for it.

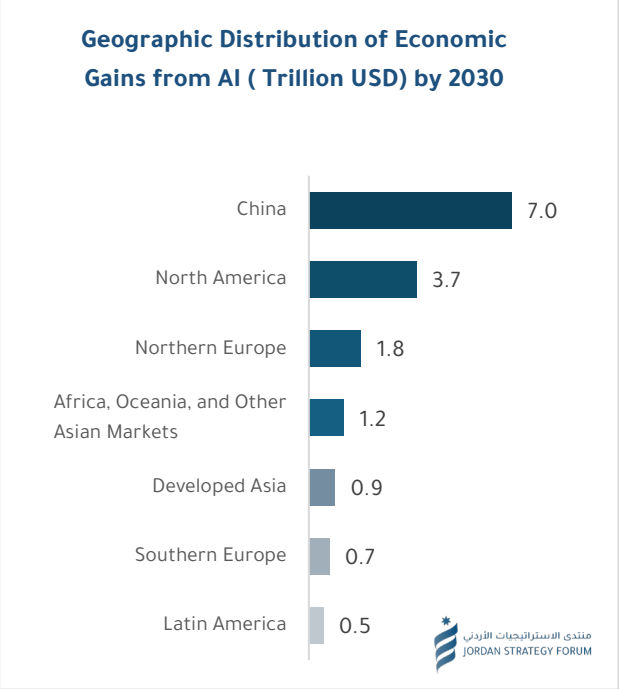
[2] OECD Artificial Intelligence Papers, 2024.

3. Artificial Intelligence: Some Informative Statistics

The socio-economic benefits of AI notwithstanding, it is informative to note the following statistics.

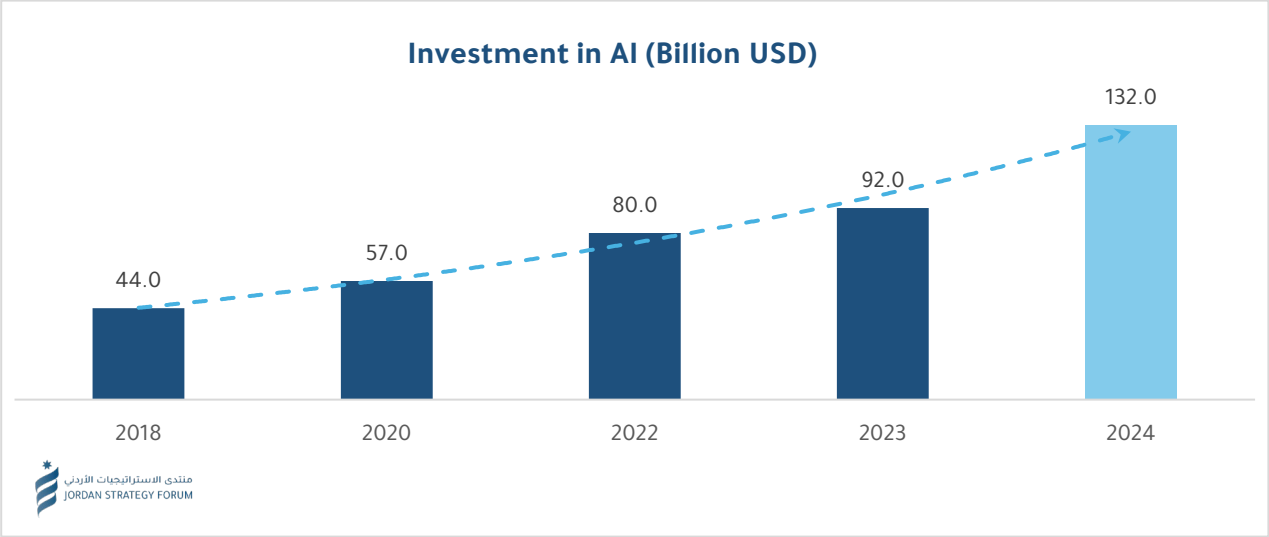
1. Artificial intelligence is expected to **boost global GDP by 14%** by the year 2030, equivalent to an additional **$15.7 trillion**.
2. **China is projected to be the biggest economic beneficiary of AI** by 2030, with its **GDP** growth anticipated to **increase by 26.1%**, **or approximately $7 trillion**. In comparison, **North America's GDP is expected to grow by 14.5%**, translating to an **estimated $3.7 trillion increase**.





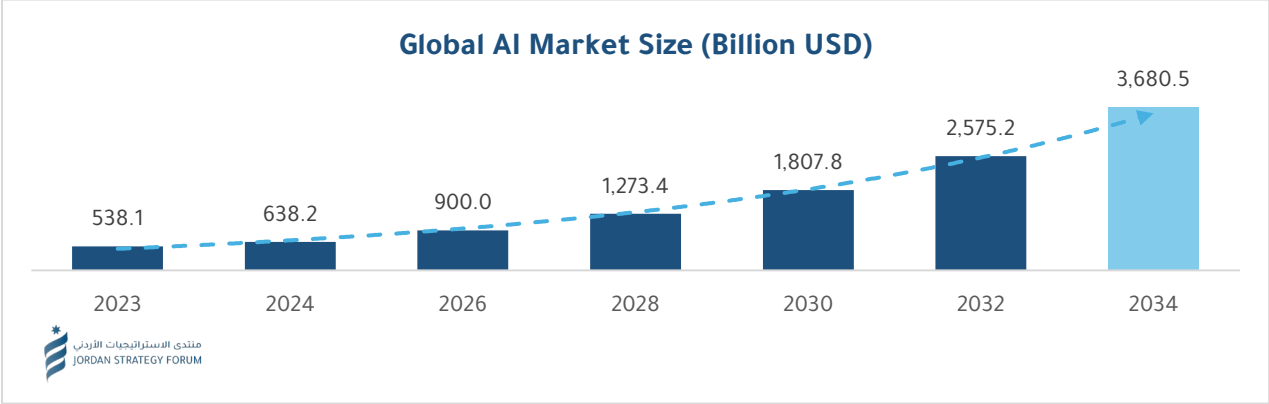
Source: PwC's Global Artificial Intelligence Study: Sizing the Prize / 2024.

3. Global investment in artificial intelligence has been steadily increasing, reaching approximately **$92 billion in 2023**. It is projected to rise to **$132 billion in 2024**, up from **$44 billion in 2018**.



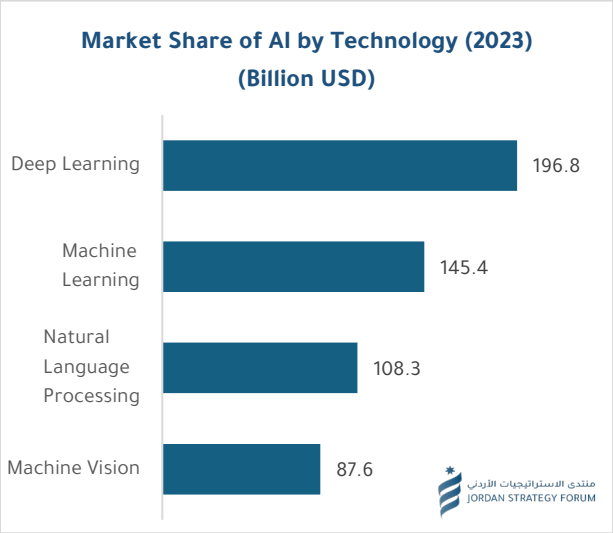
Source: Tortoise - Crunchbase Company, 2024.

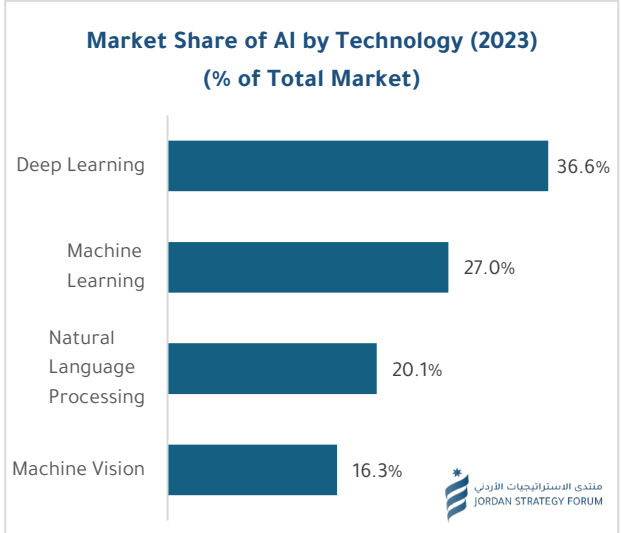
4. The global AI market size is estimated at approximately $638.2 billion as of 2024. It is projected to reach around **$3.68 trillion by 2034**.



Source: Presedenceresearch/artificial-intelligence-market, 2024.

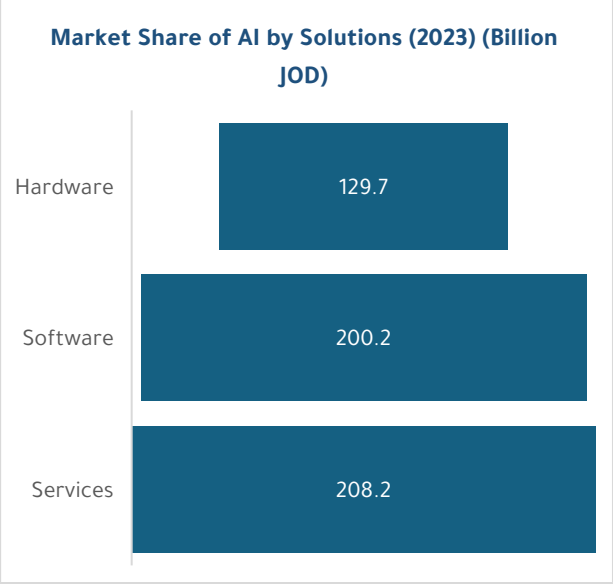
5. Deep learning technology accounted for the largest share of the global AI market in 2023, capturing 36.6%, which is equivalent to a **market value of approximately $196.8 billion**.

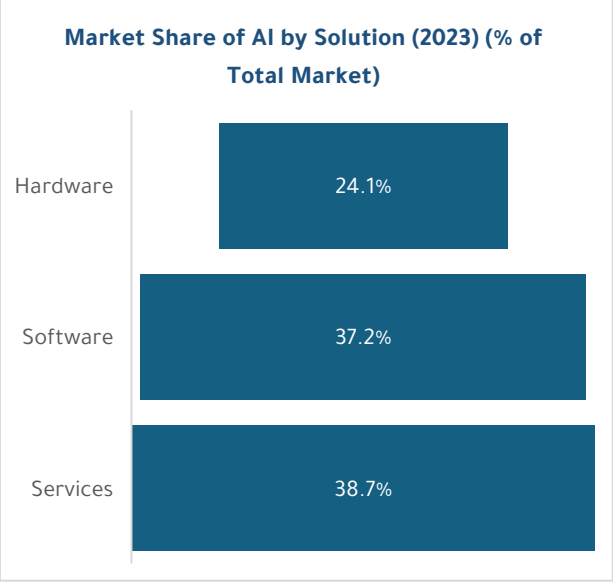




Source: Presedenceresearch/artificial-intelligence-market, 2024.

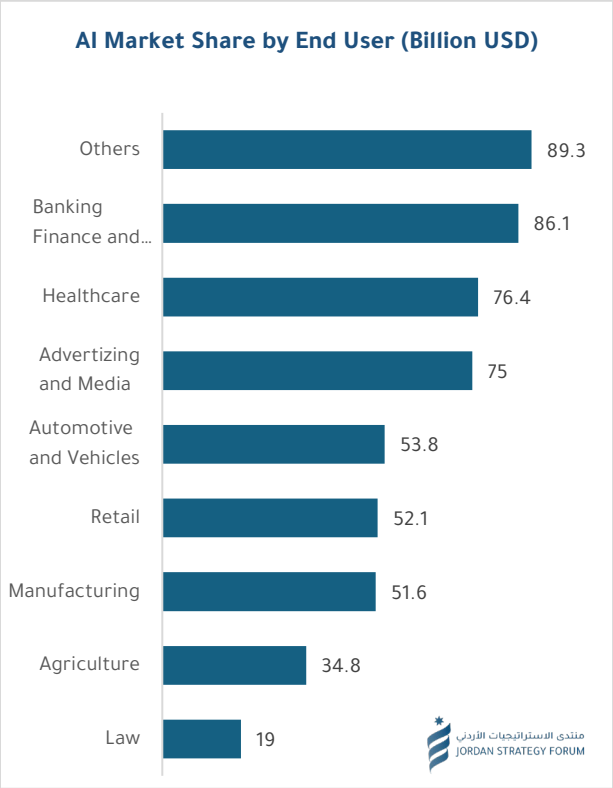
6. Based on **solutions**, the services segment accounted for the largest amount in 2023. The **$208.2 billion** which was spent on the services segment constituted **38.7% of the whole AI market size**.

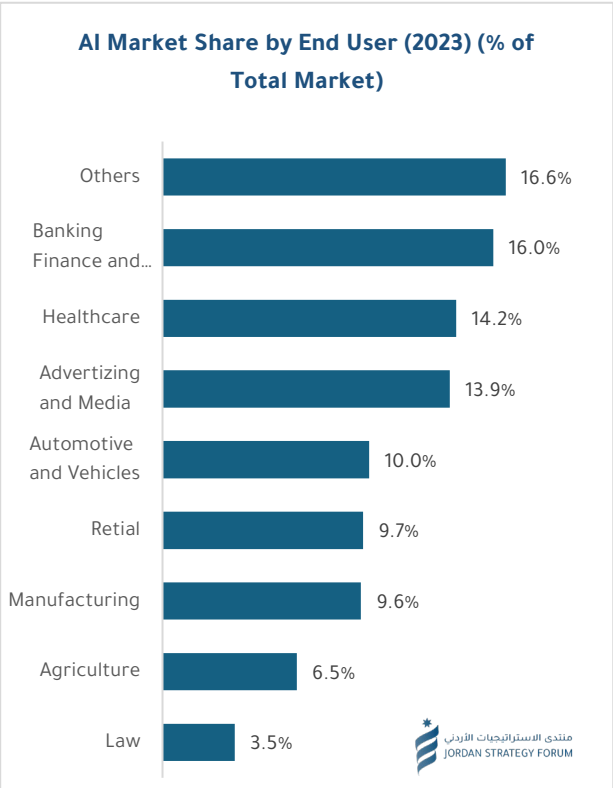




Source: Presedenceresearch/artificial-intelligence-market, 2024.

7. Based on the **end user**, banking, finance, and insurance accounted for the largest amount in 2023. The **$86.1 billion** which was spent by this sector constituted **16.6% of the whole AI market size**.





Source: Presedenceresearch/artificial-intelligence-market, 2024.

8. **By 2030, it is expected that 1 in 10 cars will be self-driving on the roads**, according to MarketsandMarkets.[3]

9. According to the World Economic Forum, **AI is expected to create around 97 million new jobs**, helping to alleviate concerns about job displacement.

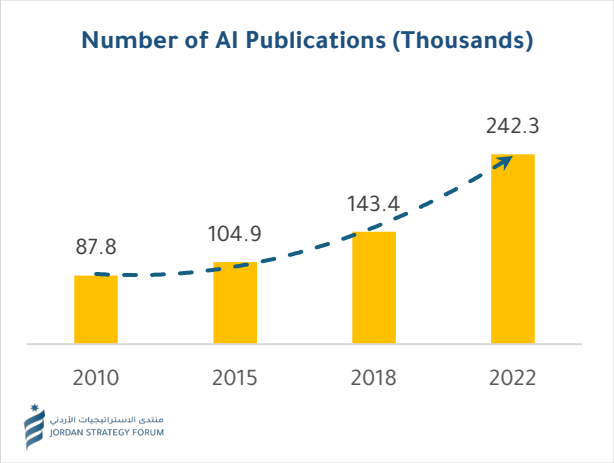
10. **The manufacturing sector is anticipated to achieve the largest financial benefit from AI adoption**, with **projected gains of around $3.8 trillion by 2035**.

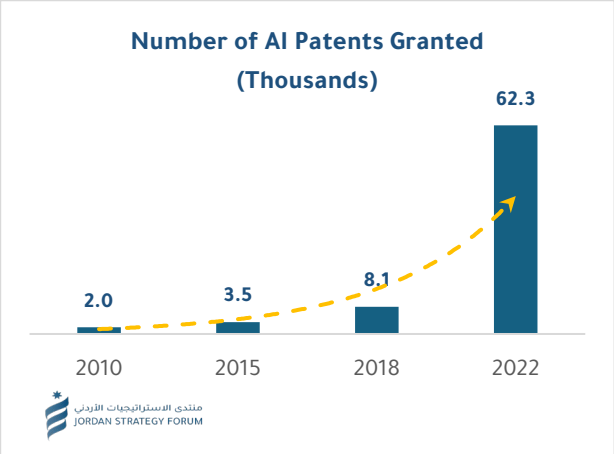
11. **The United States remains the leading source for developing cutting-edge AI models**, surpassing China, the European Union, and the United Kingdom. In 2023, institutions based in

[3] MarketsandMarkets is a global market research and consulting firm that provides quantified B2B research on high-growth emerging opportunities and threats.

the U.S. developed 61 AI models, which is significantly more than the 21 models developed in the EU and 15 models in China.[4]

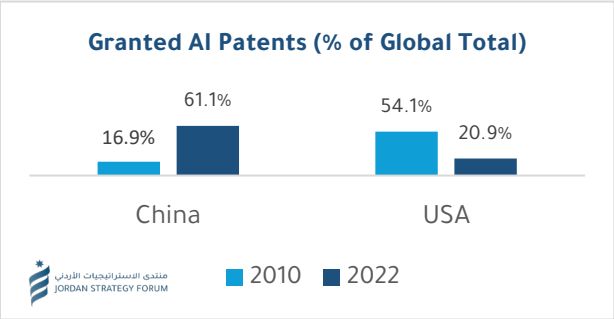
12. The **total number of AI publications in English worldwide increased from 78,800 in 2010 to 242,300 in 2022**. Similarly, **the number of AI-related patents globally grew from 2,000 in 2010 to 62,300 in 2022**.

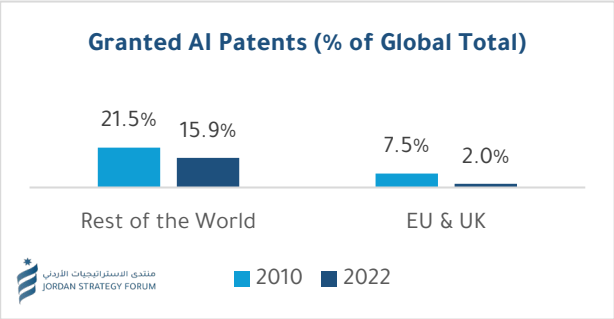




Source: Artificial Intelligence Index Report 2024 / Stanford University.

13. **China's share in the world's granted AI patents increased from 16.9% in 2010 to 61.1% in 2022. The share of the USA decreased from 54.1% in 2010 to 20.9% in 2022. The shares of the rest of the world and the EU and UK have also become lower in 2022**.





Source: Artificial Intelligence Index Report 2024 / Stanford University.

[4] Artificial Intelligence Index Report 2024 / Stanford University.

4. The Need for AI Regulation

The rapid advancement of artificial intelligence technologies brings with it tremendous potential to transform production processes and significantly accelerate productivity growth[5]. However, **this potential does not come without serious challenges**, including[6]:

First: In many applications, AI relies on a collection, and possibly, a combination, of various data sources. These can lead to **an increased risk of intrusion to privacy** in various fields, such as medical diagnosis, workplace surveillance, and public sector applications.

Second: The use of AI generated content can contribute to **misinformation** in various fields. If the generated AI content is not reliable, the processed information can negatively impact **"knowledge accumulation"** and **"sharing in science and research"** (producing fake studies with fabricated results).

Third: AI could surpass human capabilities in certain domains, leading to what's referred to as "technological runaway" a scenario where technological processes become uncontrollable.

In summary, while AI contributes to development and progress, it is surrounded by significant risks. Policymakers must take deliberate measures to safely harness AI's benefits, encourage innovation, and provide reasonable protection against potential harm.

In terms of AI governance and regulation, the World Bank's 2024 report titled "Global Trends in AI Governance: Country Updates "**identifies 14 critical risks that policymakers must address. Among the most notable are**:

1. **Bias and discrimination**: AI systems may entrench favoritism and discrimination due to underrepresented datasets and opaque algorithms.
2. **Labor market disruption**: AI technologies could cause significant upheavals in job markets, leading to job losses and widening digital inequality.
3. **Misuse and erosion of trust**: AI may facilitate the spread of misinformation, forgery, cybercrime, political interference, and fraud, thereby weakening public trust.
4. **Inequality and access**: Gaps in inclusion and growing inequalities are increasing due to disparities in access to AI technologies.

[5] According to the World Bank, 2024
[6] OECD Artificial Intelligence Papers No. 15, April 2024.

5. **Environmental impacts**: AI systems consume large amounts of energy, contributing to environmental degradation and increased carbon emissions. A study by the Massachusetts Institute of Technology (MIT) indicates that training a large model like GPT-4 may generate substantial carbon emissions. Operating these models also requires constant cooling of the hardware, which consumes massive amounts of water[7].
6. **Cybersecurity vulnerabilities**: AI systems and their applications are exposed to a range of cybersecurity vulnerabilities due to their complexity and the multiple points of weakness they contain.
7. **Privacy and data protection**: Training AI models requires vast amounts of data, which raises significant concerns about the collection and large-scale processing of personal data.
8. **Physical safety**: AI systems may fail, be subjected to security breaches, or exhibit unintended behaviors, all of which pose safety concerns.
9. **Explainability and accountability**: The lack of accountability in the use of AI systems raises serious concerns, particularly when these systems are developed and used by end-users (rather than developers) for unintended purposes.
10. **Risks Related to Deployment Contexts**: Irresponsible deployment of generative AI tools by students threatens the quality of learning and deepens their dependence on such tools.
11. **Geopolitical risks**: The development and use of AI in certain sectors can lead to a loss of control, resulting in geopolitical instability.
12. **Social and cultural impact**: Integrating AI into daily life may cause disruptions and negatively impact social norms.
13. **Intellectual property**: The large-scale collection and use of data to train AI models raises concerns about the legality of using copyrighted materials and other information protected under intellectual property laws.
14. **Psychological impact**: AI can have a profound effect on mental health and the dynamics of human-AI interaction.

In addition to the risks, the World Bank report identified **several challenges facing AI governance**, the most important of which are:

1. **Keeping pace with technological progress**: The rapid development of AI creates what is known as the "challenge of keeping pace," as it often takes months or even years to develop laws and policies, while AI technologies continue to evolve into "significant governance gaps."

[7] Explained: Generative AI's environmental impact, MIT, 2025

2. **Limited technical expertise and knowledge gaps**: Knowledge gaps related to AI technologies and applications hinder effective policymaking. For example, only 0.7% of new AI PhD graduates in the U.S. and Canada choose to work in the public sector, leading to a major shortage of technical expertise necessary for formulating effective policies and governance measures.
3. **Sector-specific governance needs:** AI governance must be tailored to the specific needs, context, and risks of each sector. For instance, the healthcare sector prioritizes patient privacy and safety, while the financial sector focuses on fraud detection and risk management.
4. **Cross-jurisdictional coordination**: Developing AI across multiple countries poses significant coordination and regulatory challenges due to differing legal frameworks. This necessitates a globally consistent legal approach to address AI governance issues.
5. **Complexity of AI supply chains**: AI systems often rely on vast amounts of data, hardware components, and specialized software sourced from numerous vendors and service providers. This makes it difficult to trace the origin of any issues, identify solutions, and regulate effectively.
6. **Balancing innovation and risk mitigation:** Sound AI governance must address ethical, technical, social, and economic challenges. Therefore, policymakers need to develop flexible governance frameworks based on clear guidelines and safeguards that allow for continued technological progress.

5. Emerging Regulatory Approaches Worldwide

On March 21, 2024, the United Nations adopted a **draft resolution on AI** titled **"Seizing the opportunities of safe and trustworthy AI systems for sustainable development," approved by 120 countries**. The resolution aims to encourage nations to protect human rights, personal data, and ensure AI oversight, though it is not legally binding. While this effort is promising in promoting AI governance, the design and development of these systems remain concentrated in the U.S., China, and some European countries–**potentially disadvantaging user nations that do not actively develop their own AI governance frameworks**.

AI Legislation Around the World

Country	Legislation/Regulatory Framework	Objective	Responsible Authority	Implementation Status	Notes
European Union	EU Artificial Intelligence Act Regulation 2024/1689	Establish a comprehensive legal framework for regulating AI systems across all EU member states	European Commission	Entered into force on August 1, 2024; full implementation by August 2, 2026	First comprehensive legal framework regulating AI globally
Japan	AI Business Guidelines - Version 1.0	Support and encourage voluntary compliance with general AI principles based on a risk-based approach	Japanese Government	Not legally binding	Replaces three previous guideline documents
United Kingdom	White Paper on AI Regulation (2023) and Government Response (2024)	Apply a principles-based regulatory framework through sector-specific regulators	Specialized regulatory bodies in each sector	No intention to issue comprehensive legislation soon	Relies on a flexible and decentralized regulatory framework
United States	No comprehensive law; over 120 AI-related bills under consideration in specialized areas	Regulate AI use in education, copyright, robocalls, bio-risks, national security, and nuclear weapons	U.S. Congress	Under discussion; no unified legislation currently in place	Cautious, innovation-oriented approach led by the private sector with minimal restrictions
China	Interim Measures for the Management of Generative AI Services (2023)	Regulate generative AI services, ensure data security, and control content	Cyberspace Administration / National Development and Reform Commission / Ministry of Education / Ministry of Science and	Entered into force on August 15, 2023	First administrative regulation for generative AI

Country	Legislation/Regulatory Framework	Objective	Responsible Authority	Implementation Status	Notes
			Technology / Ministry of Industry and IT / Ministry of Public Security / National Radio and Television Administration (jointly)		
Saudi Arabia	Draft AI Ethics Principles (2023) and Cabinet Decision No. 292	Develop policies, standards, and governance controls for AI and monitor compliance	Saudi Data and Artificial Intelligence Authority (SDAIA) (SDAIA)	Not legally binding	Work underway to develop a comprehensive regulatory framework
United Arab Emirates	Law No. 3 of 2024 - Establishment of the AI and Advanced Technology Council (AIATC)	Regulate AI projects, research, and investments in advanced technologies	AI and Advanced Technology Council (AIATC)	Under implementation	No comprehensive law, but several regulations and guidelines in place
Jordan	Jordan AI Strategy and Action Plan (2023-2027)	Build capacity, improve public sector efficiency, enhance research, support investment, and enable legal framework	Ministry of Digital Economy and Entrepreneurship	Ongoing implementation through 2027	Aims to promote safe and responsible use of AI

In this context, it is worth noting that following the implementation of the European Union's Artificial Intelligence Act, a 22% decrease in privacy complaints was recorded, reflecting the impact of regulatory frameworks in improving compliance and protecting personal data. The law also stipulates financial penalties of up to 7% of a company's global revenue for violations, underscoring the EU's commitment to enforcing strict sanctions to ensure compliance[8].

At the national level, it is noteworthy that **the fourth objective of the Jordanian National Artificial Intelligence Strategy is to "ensure a legislative and regulatory environment that supports the safe deployment of AI."** This objective emphasizes the need to encourage institutions and companies that develop and operate AI systems to adopt the National Charter for AI Ethics, and to adhere to its principles and guidelines, which promote the rule of law, human rights, democratic values, and diversity, while addressing ethical concerns related to AI use.

[8] Europe sets benchmark for rest of the world with landmark AI laws, Reuters, 2024

6. Conclusions and Recommendations

In the context of global AI regulations, it is essential for these regulations to consider the needs of countries with limited or no capabilities in the field. Furthermore, it is crucial to acknowledge the **existing gap in AI governance between wealthy and developing countries**. The United States, China, and the European Union have emerged as leaders in setting the key standards for AI governance. Today, the world is witnessing **"hot geopolitical issues"** as AI regulations rapidly evolve into a "regulatory arms race."[9]

Relative to **AI regulation**, the question is whether the on-ongoing efforts would lead to the launch of a comprehensive, practical, and enforceable global regulatory regime. However, one can argue that given the **"cultural divides, differing value judgments, and geopolitical competition"**, it is difficult, if not impossible, whether a unified framework is achievable. In other words, the world is heading toward a "regulatory arms race in which countries and corporate tech giants vie for dominance by setting conflicting principles and standards that exacerbate inequalities and leave risky AI unchecked".

Ultimately**, international coordination on AI governance is needed** to prevent a governance arms race and to prevent regulatory arbitrage as private firms seek to relocate their most harmful activities to areas of low regulatory barriers. **Ensuring a level of regulatory playing field is particularly important for smaller, less developed states** who may otherwise face pressures to lower guardrails to encourage local innovation or foster foreign investment. Without a greater say and more AI policymaking capacity, these countries are more likely to be exposed to AI risks and deprived of AI benefits.

Any global system for AI governance must involve the participation of all countries. As technology advances, AI development becomes cheaper and easier, technical knowledge spreads, and key digital resources become freely available online. This means that AI capabilities, currently possessed by only a few countries, will eventually be accessible to most countries worldwide.

Finally, on September 19, 2024, the United Nations High-Level Advisory Board issued a report on global AI governance titled "**AI Governance for Humanity**." The report emphasizes **inclusive, coordinated, and effective AI regulation**. It recommends "establishing an international scientific panel on AI, initiating policy dialogues, creating an AI standards exchange, forming a

[9] Carnegie Europe, AI Governance Race: From Diplomatic Displays to Progress, 2024.

capacity development network, launching a global AI fund, developing a global data framework, and setting up an AI office within the UN Secretariat". It is within the context of this UN effort that the Arab countries should come together and seek global agreement that provides clear guidelines and safeguards that enable technological progress.

In line with the UN's efforts, **the Jordan Strategy Forum calls on Arab countries to launch a unified Arab regulatory framework** that provides necessary guidelines and safeguards to promote technological progress in AI development and applications. This framework could adopt an 'Adaptive Governance' approach, allowing regulatory frameworks to align with the institutional and technical capabilities of Arab countries and developing flexible principles that account for the uniqueness of national contexts. **It is proposed to begin by establishing a "Unified Arab Platform" to monitor AI applications** as the first step toward enhancing regional cooperation in this field.

The Forum also recommends **including performance indicators such as "compliance rates" and "the number of recorded violations"** to strengthen the effectiveness of regulatory frameworks and measure their impact. Additionally, imposing substantial financial penalties will help limit violations related to privacy and the unlawful use of AI tools.

Artificial Intelligence: Challenges and Opportunities

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Risks of Artificial Intelligence

1. Bias and Discrimination
2. Labor Market Disruption
3. Misuse and Erosion of Trust
4. Inequality and Access
5. Environmental Impacts
6. Cybersecurity Vulnerabilities
7. Privacy and Data Protection

8. Physical Safety
9. Accountability Risks
10. Deployment-Context Risks
11. Geopolitical Risks
12. Socio-cultural Impact
13. Intellectual Property
14. Psychological Impact

AI Legislation Around the World

USA
More than 120 bills in specialized areas under consideration in Congress

UK
Position Paper on the Normalization of AI (2023) and the Government's response (2024)

Japan
AI Guidelines for Businesses - Version 1.0

EU
European Union AI Act Regulation 2024/1689

Jordan
Jordan's AI Strategy and Implementation Plan (2023-2027)

UAE
Law No.3 of 2024 - Establishment of the AI and Advanced Technology Council (AIATC)

KSA
Draft Principles of AI Ethics (2023) and Cabinet Decision No.292

China
Interim Measures for the Management of Generative AI Services (2023)

Jordan Strategy Forum Recommendations in Response to the Development of Artificial Intelligence Systems

Enforce significant financial penalties to limit violations related to data privacy and the unlawful use of AI tools.

Incorporate performance indicators—such as compliance rates and the number of recorded violations—to enhance the effectiveness of regulatory frameworks and evaluate their impact.

Establish a "Unified Arab Platform" as an initial step to monitor and track AI usage across the region.

Initiate a unified Arab regulatory framework that sets clear guidelines and safeguards to encourage the responsible and effective use of artificial intelligence.

Source: The Jordan Strategy Forum's Knowledge is Power Report "Towards Effective Governance of Artificial Intelligence: A Look at International Figures and Models"
Date: May 2025

Some Facts and Figures About Artificial Intelligence Globally

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An expected increase of 14% in global GDP

by 2030 due to AI (an additional $15.7 trillion).

$92 billion Invested globally in AI

in 2023 and is expected to reach $132 billion in 2024.

242,300 publications on AI

in English globally in 2022, up from 78,000 in 2010.

97 million new expected jobs

because of Artificial Intelligence.

$638.2 billion the size of the AI market

globally as of 2024 and is expected to reach $3.68 trillion in 2034.

62,300 AI patents

globally in 2022, up from 2,000 in 2010.

Geographical Distribution of Economic Gains from AI as a Percentage of GDP by 2030

16.6%

Financial Services and insurance share of the AI market size in 2023 (valued at $86.1 billion)

38.7%

Services Solutions' share of the AI market size in 2023 (worth $208.2 billion).

36.6%

Deep Learning Technology's share of the AI market in 2023 (worth $196.8 billion).

Source: The Jordan Strategy Forum's Knowledge is Power Report "Towards Effective Governance of Artificial Intelligence: A Look at International Figures and Models"
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