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EGYPT

Artificial Intelligence

Readiness Assessment Report

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2025

ACKNOWLEDGEMENTS

This publication was developed by the UNESCO Office for Egypt and Sudan as part of UNESCO's ongoing efforts to support countries in assessing their readiness to apply Artificial Intelligence ethically and responsibly. The work was carried out under the overall guidance of the Director of the Office, Dr. Nuria Sanz, and led by the Social and Human Sciences Unit, under the direction of Ms. Areej Atalla.

We extend our sincere gratitude to the Government of Egypt for its conti nued support throughout this process. Demonstrating its strong commitment to the responsible development of Artificial Intelligence, the Government of Egypt translated the Readiness Assessment Methodology questionnaire into Arabic, with the aim of extending its benefits to Arabic-speaking countries across the region.

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Through these collaborative efforts, Egypt continues to demonstrate its commitment to harnessing AI in a responsible and inclusive manner, while also contributing to the global dialogue on ethical AI development.

Finally, we express our deep gratitude to the European Union and the Directorate General for International Partnerships (DG INTPA) for their crucial financial support for this initiative.

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ACRONYMSAND ABBREVIATIONS

AI	Artificial Intelligence
BPO	Business Process Outsourcing
CAPMAS	Central Agency for Public Mobilization and Statistic
EGDI	E-Government Development Index
EKB	Egyptian Knowledge Bank
GDP	Gross Domestic Product
GERD	Gross Expenditure on Research and Development
GII	Global Innovation Index
GoE	The Government of Egypt
ITI	Information Technology Institute
ITIDA	Egyptian Information Technology Industry Development
ITIDA-TIEC	Technology Innovation and Entrepreneurship Center
ITU	International Telecommunication Union
4IR	Fourth Industrial Revolution
LLM	Large Language Models
MCIT	The Ministry of Communication and Information Technology
MoC	Ministry of Culture
NAIS	National Artificial Intelligence Strategy
NCAI	National Council for Artificial Intelligence
NCW	National Council for Women
NTI	National Telecommunication Institute
ODC	Opening Data Charter
OECD	Organization for Economic Co-operation and Development
ODIN	Open Data Inventory
PDPL	Personal Data Protection Law
RAM	The Readiness Assessment Methodology
R&D	Research and Development
SDGs	Sustainable Development Goals
SECC	Software Engineering Competence Center
STEM	Science, Technology, Engineering, and Mathematics
STDF	The Egyptian Science & Technology Development Fund
UIS	UNESCO Institute for Statistics
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNCTAD	United Nations Conference on Trade and Development
WIPO	World Intellectual Property Organization

FOREWORD

We have officially entered the Age of Artificial Intelligence (AI). The world is now changing at a faster pace not seen for decades, or even centuries. AI-based tools and applications make our lives easier, smoother, and richer. They help us move more efficiently, get informed, get credit, get a job, and get our taxes done.

But in its current form, AI reproduces and amplifies many of the social challenges we face. It is unacceptable that around half of the world's population still lacks adequate internet access. The AI industry is highly concentrated between just two countries – the United States and China – with only a dozen companies accounting for a major share of the sector. This monopolization can only lead to greater inequality – including gender disparities. Non-diverse AI teams, unrepresentative datasets, and opaque and biased algorithms can cause harm, particularly to those who are already vulnerable, whether companies or individuals, children and young people, women, or entire democracies.

To combat this, UNESCO drafted the 'Recommendation on the Ethics of Artificial Intelligence', which was adopted in 2021 by 193 countries to make sure AI delivers fair, sustainable, and inclusive outcomes. The Recommendation is based on the protection and promotion of human rights, human dignity, and environmental sustainability, the values of which are then translated into principles such as accountability, transparency, and privacy. The Recommendation also sets out concrete policy actions that governments can draw on to steer technological development in a responsible direction, premised on the belief that light-touch regulation, which has until now remained the norm, is insufficient. We need capable governments that are well equipped, in terms of competencies, institutions and laws, to frame responsible AI development and protect the rule of law online, and to hold accountable public and private developers, making sure that they put human rights and fundamental freedoms first, rather than profits or geopolitical considerations.

The Readiness Assessment Methodology (RAM) is a diagnostic tool intended to assist Member States in upholding their commitment to the Recommendation by helping them understand how prepared they are to implement AI ethically and responsibly for all their citizens. By highlighting any institutional, regulatory or data gaps and obstacles, it enables UNESCO to tailor support for governments to fill those gaps to ensure an ethical AI ecosystem aligned with the Recommendation.

The RAM questionnaire forms the basis for the first section of this readiness assessment report, providing a comprehensive but detailed overview of laws, institutions, and the cultural, social, and human capital landscape shaping AI in Egypt. This is then complemented in the second section by a summary of concerns and priorities raised during a national multi-stakeholder consultation that was conducted in 2025. Finally, the third section presents a roadmap with recommendations for building capacities across national institutions, laws and policies, and human capital, to achieve a responsible AI ecosystem aligned with the UNESCO Recommendation.

Egypt has made notable progress in its AI journey, particularly in legislation, institutional development, and digital infrastructure. Key milestones include the issuance of the National AI Strategy (notably its second edition), the Personal Data Protection Law No.151 (2020), the adoption of the Egyptian Charter for Responsible AI, and the establishment of the National Council for Artificial Intelligence (NCAI). These developments reflect a strong political will to promote ethical and responsible AI.

Infrastructure advancements—such as the construction of over 6,000 km of fiber optic network and the connection of 1,458 villages—have significantly improved broadband access and contributed to narrowing Egypt's rural connectivity gap currently estimated at 13%. According to the Oxford Insights Government AI Readiness Index, Egypt now ranks 1st in Africa, among the top 10 in the MENA region, and 62nd globally, signaling its growing readiness to harness AI in public service and governance.

While Egypt has made commendable progress in developing its AI ecosystem, the RAM identifies valuable opportunities to further accelerate this momentum. Advancing the adoption of cloud computing frameworks, enhancing national computing capacity, and cultivating a strong pool of skilled AI professionals are essential steps toward unlocking the full potential of AI across all sectors. Enhancing both the quality and quantity of capacity-building initiatives is critical to keeping pace with the rapidly evolving nature of AI. While Egypt already hosts a variety of ambitious programs, the focus is now on implementing a coordinated and inclusive capacity-building strategy that unifies fragmented training programs and extends opportunities to underrepresented groups, developing high-end domestic talent, retaining skilled professionals, and establishing a robust qualification and certification system for AI practitioners. This priority is reflected in the Government of Egypt's national AI strategy, which includes a pillar focusing on developing a comprehensive educational approach and has led to initiatives such as a recent presidential decree mandating the integration of AI education at the primary school level, signaling a commitment to preparing future generations for the AI-driven economy.

Equally important is the establishment of comprehensive, sector-specific AI legislation to provide the regulatory clarity needed for sustainable innovation and responsible deployment. To achieve these goals, the report recommends that Egypt prioritize the creation of a national legislative roadmap for AI, outlining clear timelines for enacting and updating key laws ahead of a comprehensive AI framework. In parallel, efforts should focus on scaling national computing infrastructure, and accelerating cloud adoption to support AI applications and services.

Overall, this report presents a fundamentally optimistic vision that we at UNESCO share: that ethical governance and responsible regulation of AI are entirely consistent with innovation and economic growth and is essential for ensuring a technological ecosystem that benefits the public good. With the RAM data and this report, Egypt has a clear roadmap for how to get there.

It was a pleasure working with the Government of Egypt to conduct this exercise. We are grateful for their engagement with the RAM and I am sure that by following the path laid out in this report, Egypt will be able to reap the benefits of AI while making sure that AI technologies deliver fair, sustainable, and inclusive outcomes.

Lidia Brito
Assistant Director-General ad interim for Social and Human Sciences, UNESCO

FOREWORD

Artificial Intelligence is not merely a technological advancement—it is a transformational force that is shaping the future of our economies, societies, and institutions everyday. In Egypt, we firmly believe that AI must serve a higher citizen-centric purpose: to empower people, unlock talent, and drive inclusive development across all sectors of society.
Since the launch of Egypt's first National AI Strategy in 2021, we have made considerable progress in laying the foundations for a human-centric AI ecosystem. We established national governance frameworks, introduced AI ethics guidelines aligned with international standards, launched impactful AI use cases in sectors such as healthcare and agriculture, and upskilled hundreds of thousands of Egyptians in digital and AI-related skills. These achievements mark the beginning of a longer journey toward building a knowledge-based economy that is both globally competitive and locally relevant.

The Readiness Assessment Methodology developed by UNESCO plays a vital role in guiding and measuring this progress, enabling us to take a structured, evidence-based approach to identifying opportunities, gaps, and priorities across policy, infrastructure, and applied innovation.

As we embark on the second phase of our National AI Strategy, this report provides not only a snapshot of where we stand—but a compass for where we aim to go.

We extend our sincere appreciation to UNESCO and all national stakeholders who contributed to this work. Together, we are shaping an AI future that is responsible, inclusive, and purpose-driven—for Egypt, for Africa, and for the world.

H.E. Dr. Amr S. Talaat
Minister of Communications & Information Technology, Egypt

EXECUTIVE SUMMARY

In November 193 ,2021 Member States of UNESCO adopted the Recommendation on the Ethics of Artificial Intelligence, the first global normative instrument in its domain. The Recommendation provides a comprehensive and actionable framework for the ethical development and use of AI, encompassing the full spectrum of human rights. It achieves this by addressing all stages of the AI system lifecycle.

The Recommendation in Paragraph 49 notes: "UNESCO recognizes that member States will be at different stages of readiness to implement this recommendation, in terms of scientific, technological, economic, educational, legal, regulatory, infrastructural, societal, cultural and other dimensions. It is noted that 'readiness' here is a dynamic status."[1]

UNESCO developed the Readiness Assessment Methodology (RAM), a diagnostic tool to help Member States evaluate their preparedness to implement AI ethically and responsibly. RAM highlights institutional and regulatory gaps, enabling UNESCO to provide tailored support for policy reform and capacity-building.

A critical initial stage in implementing the Recommendation is the deployment of RAM, which will assist Member States in identifying their status at specific stages of their readiness journey across multiple dimensions: legal/regulatory, social/cultural, scientific/educational, economic, and technical/infrastructural. This report applies the RAM in Egypt, analyzing each of the five dimensions to identify opportunities to enhance AI governance and landscape.

Egypt released its edition of National Artificial Intelligence Strategy (NAIS) in 2021. In response to rapid developments in AI technology, including the emergence of generative AI, the second edition of the NAIS was adopted by the Egyptian government in January 2025. Egypt has made notable progress in both developing AI technologies and improving its readiness for ethical AI implementation. Due to several achievements in the field, Egypt was ranked first in Africa, among the top ten countries in the MENA region, and 65th globally out of 188 countries. Egypt's AI landscape indicates that it has the potential to position itself to become a leader in responsible and impactful AI, using technology to drive economic growth, foster social progress, and address national challenges.

Nevertheless, this report does not aim to rank Egypt based on its AI usage. Instead, it seeks to help the country identify strategic areas for improvement to further elevate its global and regional standing. The main aim of this report is to identify opportunities to enhance the AI governance landscape and to provide an evidence-based framework for the ethical governance of AI. The report includes short- and long-term goals, which prioritize human capacity, policies, and regulations in order to address the challenges presented by AI such as reinforcing traditional algorithmic biases and ensuring that AI development remains human-centered.

[1] . *UNESCO, Recommendation on the Ethics of Artificial Intelligence, 2021.*

A comprehensive analysis of Egypt's AI landscape, as outlined in this report, identifies key areas where strategic development can further accelerate progress—particularly within the legal and institutional frameworks. Notably, the forthcoming executive regulations under the Personal Data Protection Law, and the establishment of the Personal Data Protection Center, will be critical steps to demonstrate Egypt's commitment to strengthening its data governance and regulatory environment.

The report also highlights the need to enhance legal infrastructure, such as implementing a clear framework for data access and information sharing and introducing robust data classification regulations. Advancing these measures will provide a strong foundation for responsible AI deployment and foster greater trust in digital systems. Practical plans to effectively address those needs are found in the 2nd edition of the NAIS, and these should be implemented as a priority.

On the infrastructural front, the report emphasizes the importance of accelerating the adoption of cloud computing frameworks and expanding national computing capacity. The Cloud First Policy adopted in 2024 and The Regulatory Framework for Data Centers and Cloud Services adopted in 2021 are key tools meant to speed up these enhancements which are vital for supporting large-scale AI applications. At the same time, there is a need to address the shortage of skilled AI professionals by investing further in talent development, retention, and comprehensive governance frameworks.

To guide this transformative journey, the report strongly recommends the adoption of a national legislative roadmap to ensure the timely and sequential issuance and amendment of essential and sectoral laws. The adoption of a comprehensive AI law is still a debatable issue and subject to intense multi stakeholder consultation as the GoE seeks a balanced approach between positive regulations to shape a responsible AI ecosystem and free innovation. Additionally, Egypt is encouraged to position itself as a hub for international collaboration by attracting global companies to invest in and contribute to AI initiatives.

The report provides practical, actionable recommendations that can be implemented over a five-year horizon—laying the groundwork for Egypt to solidify its role as a regional leader in AI innovation and governance.

The implementation of the RAM consists of two stages:

1. **Diagnosis** of the national AI landscape
2. **Policy recommendations** for enhancing AI governance and ethics

Through this assessment, Egypt is provided with a clear and actionable roadmap to advance ethical AI development, reinforce human rights, and build a sustainable, inclusive digital future.

METHODOLOGY

To implement RAM in Egypt, this report employed a mixed- methods approach, with a focus on quantitative data collection across five key dimensions. The following methods were used:

- Desk review: This report was developed based on an extensive review of available reports, academic articles, and national laws. The desk review provided the foundation to produce an initial diagnosis report on Egypt's AI readiness and progress.

- Focus Group Discussion (FGD): The UNESCO Cairo office, in collaboration with the Ministry of Communication and Information Technology (MCIT), organized two multi-stakeholder consultation meetings. These meetings were structured into five group discussions, each addressing one of the RAM dimensions: legal, cultural and social, economic, educational and scientific, and infrastructural. The total number of participants in these consultations was around 250.

- Individual Interviews: Thirty interviews were conducted with experts on AI-related issues. Participants were drawn from government entities, the private sector, civil society, academia and research institutions, contributing to diverse insights across RAM dimensions.

DIAGNOSIS OF THE NATIONAL AI LANDSCAPE

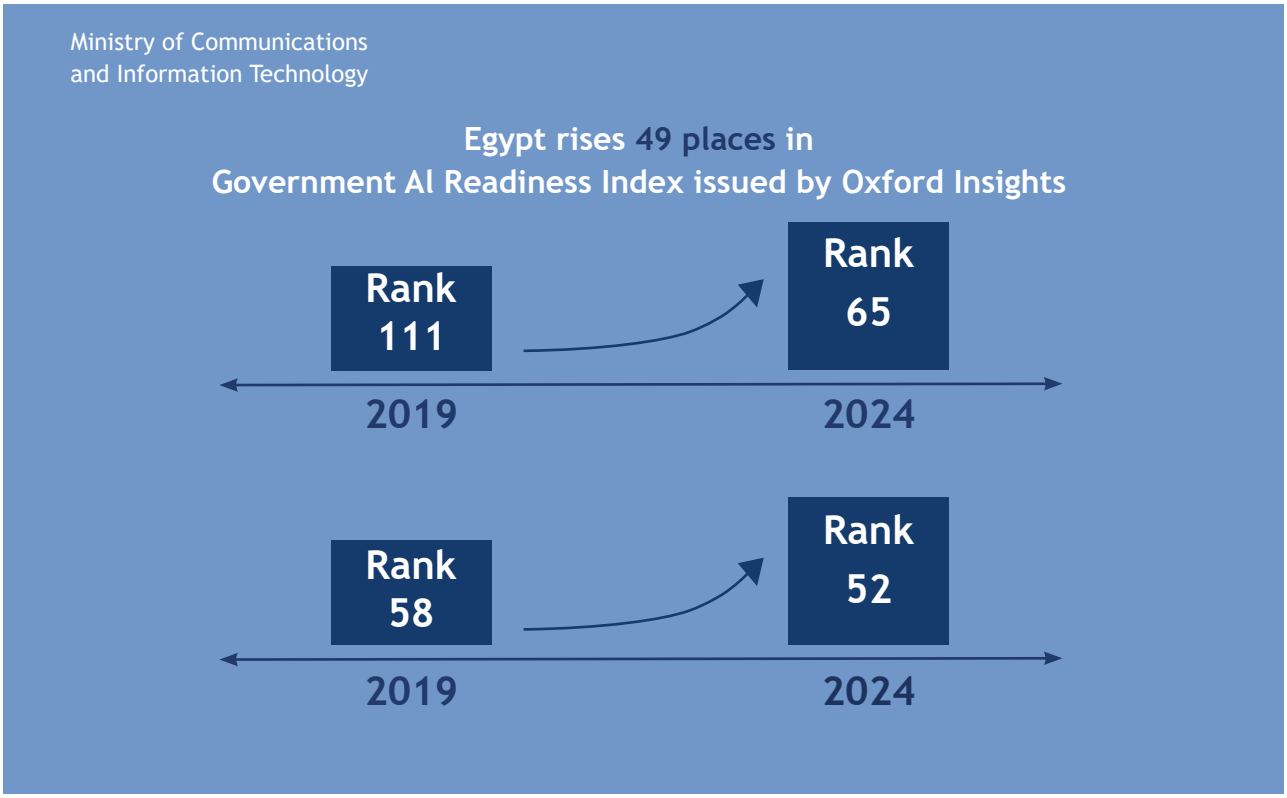
According to Tortoise Media's 2023 Global AI Index, Egypt made notable strides towards AI integration, moving up seven positions overall and advancing 17 positions in the skill-related AI index by mid- 2023 [2]. In 2024, Egypt ranked 52nd, improving from 58th in 2019.

In *2024 Government AI Readiness Index* issued by Oxford Insights, Egypt ranked 65th out of 188 countries, compared to 111th in 2019. The same report positioned Egypt as 1st in Africa, and 7th in the MENA region[3].

The *Government AI Readiness Index*, developed by Oxford Insights, is a framework designed to assess how prepared governments are to implement and leverage AI technologies in public service delivery and governance. It evaluates various factors, including national AI policy frameworks, data availability, technological infrastructure, and workforce skills.

According to the index, Egypt received a public sector AI development score of 43.13, while its rank is 36th globally on this sub-indicator[4].

FIG 1 **Egypt's rank in the Oxford Insights Government AI Readiness Index and Tortoise Global AI Index**



SOURCE: MCIT

[2]*Tortoise Media, AI index 2024 https://www.tortoisemedia.com/2024/09/19/the-global-artificial-intelligence-index-2024 accessed (March 2025)*
[3]*Oxford Insights, Government AI Readiness Index, (2024),p.24.*
[4]*Oxford Insights. (2021). AI Readiness Index 2024. https://www.oxfordinsights.com/ai-readiness-index-2024*

Egypt began developing laws and regulations related to the ethics, governance and responsible use of AI, even before the adoption of UNESCO's Recommendation on the Ethics of AI in 2021. For example, the cybercrime law and personal data protection law were enacted in 2018 and 2020 respectively.

In 2019, the Egyptian government established the National Council for Artificial Intelligence (NCAI). One year later, the NCAI drafted and adopted the first edition of the Egyptian National AI Strategy (NAIS)[5].

In response to the emergence of large language model (LLM) and generative AI technologies in 2023, the government launched the second edition of the NAIS (2025-2030)[6], in January 2025. The 2nd edition of the NAIS marks the beginning of a new phase in Egypt's AI journey, reflecting the country's shift toward deeper integration of advanced technologies, such as generative AI, and a stronger focus on ethical and institutional readiness.[7].

According to the first edition of the NAIS: "The main objective of the National Council for Artificial Intelligence (NCAI) is to prepare, formalize, approve and govern the implementation of Egypt's National AI Strategy."[8]

The responsibilities of the NCAI are as follows:

- Outlining the National AI Strategy
- Developing a follow up mechanism for the implementation of the strategy in a way that adheres to international best practices in this field
- Identifying national priorities in AI applications.
- Recommending national policies and plans pertaining to the technical, legal and economic
- framework of AI applications.
- Reviewing any kind of cooperation both regionally and internationally which includes exchanging best practices and expertise.
- Identifying AI applications that provide smart, safe and sustainable solutions and services.
- Reviewing international protocols and agreements in the field of AI.
- Recommending programs for capacity building and for supporting the AI industry in Egypt"[9].

In 2023, Egypt adopted the Charter for Responsible AI, which establishes ethical guidelines for the use of artificial intelligence. One of its key provisions is to ensure that end users are clearly informed in advance when they are interacting with an AI system rather than a human being.

MCIT is the ministry responsible for AI governance and implementation of the national AI strategy. It is worth mentioning that, as is common practice globally, Egypt's NAIS and the Charter for Responsible AI do not carry legal status. The Charter functions as a non-binding ethical framework, offering guidance on responsible AI development and use while paving the way for future regulatory evolution.

[5]. *National AI Strategy 1st edition 2021, URL: https://ai.gov.eg/*
[6]. *National AI Strategy, 2nd edition, 2025, URL: https://ai.gov.eg/*
[7]. *National AI Strategy, 2nd edition, 2025, p.6*
[8]. *National AI Strategy, 2nd edition, 2025, p.7.*
[9]. *National AI Strategy, 2nd edition, 2025, p.7*

LEGAL AND REGULATORY

Background

The legal/regulatory dimension, which includes the capacity to implement and enforce relevant frameworks, is a critical component in assessing Egypt's preparedness to implement the Recommendation. More broadly, it reflects the country's ability to respond to the societal transformations brought about by the increasing adoption of AI across all sectors of the economy.

The dimension addresses both institutional capacity and human capital, focusing on Egypt's ability to design, enforce, and evaluate legal mechanisms that ensure the ethical development and deployment of AI. It includes provisions for protection, enforcement, redress, and monitoring of potential harms associated with AI systems.

Specifically, this assessment examines whether Egypt has established adequate regulatory frameworks that uphold ethical standards in AI use, and whether there are effective monitoring and evaluation mechanisms in place to support their implementation and enforcement.

To address this, the Egyptian government introduced the Egypt National AI Regulatory System in the 2nd edition of the NAIS. This initiative aims to ensure the ethical and responsible use of AI through legal, regulatory and institutional mechanisms. According to the 2nd edition of the NAIS, the AI Regulatory System will be based on three components:

1. The charter for responsible AI,
2. An AI law,
3. The establishment of the Responsible AI Center (RAIC)

The Egypt National AI Regulatory System is "envisioned as a comprehensive approach that directs the strategic growth of Egypt's AI capabilities and ensures that this growth is managed responsibly, transparently, and in alignment with best global practices"[10] .

[10] *Nation AI Strategy, 2nd edition, Op. cit., p. 28*

The 2nd edition of the NAIS affirms that:

«To maintain the safe and responsible growth of AI, it is it imperative to establish a thorough regulatory etructure, construct a thorough ethical framework, and create a distinct regulatory body. This would not only aid in averting any dangers but also encourage the equitable, open, and sustainable advancement of AI technology, enabling it to genuinely serve as a tremendous instrument for the advancencent of humanity.

The Center for Responsible AI focuses on:

- Ensuring that the development and deployment of AI technologies are aligned with ethical standards, fairness, transparency, and accountaability
- Having sufficient expertise to understand and assess the complexities of AI and enhance human capacity in Egypt
- Engage in international cooperation by monitoring global developments and best practices in responsible AI and sharing knowledge with relevant international organizations and similar entities worldwide

AI policy and regulation

In November 2019, the Egyptian Cabinet approved the establishment of the National Council for Artificial Intelligence (NCAI). The first responsibility of the NCAI was to draft and adopt a NAIS, the 1st edition of which was completed in July 2021. In January 2025, Egypt's President Abdel Fattah El Sisi launched the 2nd edition of the NAIS, 2030-2025'.

The main objectives of the 2nd edition of the NAIS are:

- Inclusive AI to foster Digital Egypt, promoting social and economic development which benefits all Egyptians.
- National foundational model as a basis to drive industry development and regional cooperation, making Egypt a leader in AI in Africa and the Arab region and an active international player.[11]

[11].*National AI Strategy , 2nd edition, p. 7.*

According to Egypt's 2nd edition of the NAIS, the Egyptian State aims to achieve the following six strategic objectives by 2030:

1. "Ensure ethical and responsible AI use by establishing a comprehensive AI regulatory system, activate the ethical framework, and put a nucleus for a clear regulatory body, actively contributing to global efforts and playing an active role in AI different international fora."
2. "Enhance quality of life and sectoral efficiency through AI applications"
3. "Ensure data accessibility and sharing by developing frameworks for national data governance and strengthening life cycle management of domestic data."
4. "Build a robust scalable AI infrastructure and cloud services, innovate business models, and create a good digital foundation for the development of the AI industry with the support of infrastructure development."
5. "Create a healthy AI ecosystem by supporting local startups, small and medium enterprises, and innovation efforts, and strengthening the investment of venture capital institutions in Egypt."
6. "Strengthening the quantity and quality of local AI talents and experts"[12].

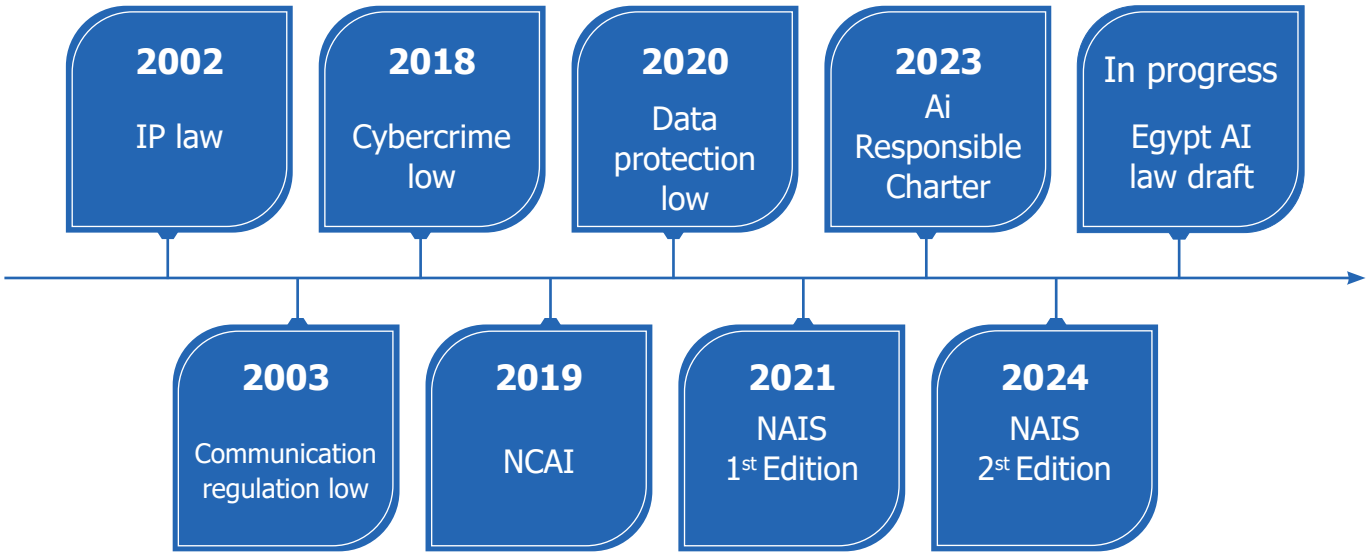
To achieve these objectives, the 2nd edition of the NAIS includes a Monitoring and Evaluation process. The NAIS explicitly states that:

"To effectively implement, monitor, and evaluate Egypt National AI strategy, we based our monitoring and evaluation process on " Quality Strategy with Effective Oversight.[13]" This process reflects the following principles:

- **Strategic Clarity:** The strategy envisions a future in which objectives are clear, and the pathways to achieve them are well-defined and practical.
- **Seamless Execution, Monitoring, and Evaluation:** The system ensures that progress is always measurable and aligned with strategic vision.
- **Evaluation is based on the Capacity Assessment Framework methodology**, where indicators for the six pillars have been identified and incorporated[14]".

[12].*National AI Strategy , 2nd edition, p.7.*
[13].*National AI Strategy , 2nd edition, p.87.*
[14].*National AI Strategy , 2nd edition, p.87*

AI Governance progress 2002 - 2025



Although the Egyptian government has adopted a NAIS and established a NCAI, binding AI regulation has not yet been enacted into law. In 2018 and 2020, Egypt adopted new laws in cybersecurity and personal data protection, respectively — both of which could theoretically be applied to the regulation of AI. These operate alongside existing constitutional provisions and other related legislation, such as the intellectual property rights protection Law No. 82 of 2002.

Furthermore, in 2023, the NCAI adopted the Egyptian Charter for Responsible AI. According to the charter, its main purpose is to:

> *"Serves as the first attempt at articulating Egypt's interpretation of the various guidelines on ethical and responsible AI, adapted to the local context and combined with actionable insights to help ensure the responsible development, deployment, management, and use of AI systems in the country. It draws upon the guidelines developed by the OECD, UNESCO, WHO, IEEE, EU, as well as by many leading countries such as Singapore, UK, US, Australia, and others[15]"*

The first edition of the NAIS acknowledges its limitations, stating:

> *"The current legislative system does not cover the emerging challenges that AI presents, e.g., ethical issues, liability, data bias"[16].*

[15] *Egyptian charter for responsible AI, p.1,*
[16] *National AI Strategy, 1st edition, 2021, p. 21*

This RAM report further clarifies the existing legal gaps, highlighting the extent to which the current legal framework is insufficient to address the challenges and risks posed by AI. Additionally, the strategy acknowledges that:

> *"The existence of policies, regulations, and legislations to mitigate potential misuse whether ethical, legal, or socio-economic, can promote and enable the widespread adoption of AI solutions"[17].*

It also recommends:

> *"Communicate and coordinate with appropriate government bodies to issue legislations and regulations when and where needed"[18].*

The 2nd edition of the NAIS places greater emphasis on the need to establish dedicated AI legislation. It states:

> *"It is essential to establish a comprehensive regulatory framework, as AI, like any other technology field, requires adequate legislation and regulatory structures in order to prevent abuse and wrongdoing. For example, the AI law has established clear legal limitations for the usage and development of AI, guaranteeing that technological advancements do not threaten public interest. The regulatory structure must include not only technological requirements and data protection but also oversight of AI decision-making processes to minimize algorithmic prejudice and bias.[19]"*

Dr. Mohamed Hegazy, a legal expert in digital legislation, states:

> *"It is essential to determine the goals behind adopting AI law—whether it will be to organize the utilization of foreign AI applications, or to organize, build, and develop national applications, or to criminalize the risks resulting from the misuse of AI applications.[20]"*

According to an interview conducted with Judge Waleed Amin, Legal Counsel and Supervisor of the Legal and Compliance Sector at the Information Technology Industry Development Authority (ITIDA):

> *"Egypt's government has started drafting Egyptian AI law, but it is still in the develop-mental stage.[21]"*

[17] National AI Strategy, 1st edition, 2021, p.47
[18] National AI Strategy, 1st edition, 2021, p.47.
[19] National AI Strategy, 2nd edition, 2025, p.47.
[20]. Interview with Dr. Mohamed Hegazy, Expert on digital legislation and former head of legislation committee - MCIT, 7 April 2025.
[21]. Interview with Judge Waleed Amin, The Legal Counsel and Supervisor of Legal and Compliance sector at the Information Technology Industry Development Authority (ITIDA), 9 April 2025.

Judge Amin added:

> *"The philosophy of the drafted law is to regulate and incentivize not to punish, but rather to encourage and support innovation."*

According to Dr. Hoda Baraka, Advisor to the Minister of Communication and Information Technology for Technology Talents Development:

> *"The proposed drafted law Includes applications classification based on risk. Applications are classified as prohibited applications, high risk applications and low risk applications.[22]".*

Ms Noha Fathy, an internet governance expert, recommends:

> *"Adopting a legislative roadmap for the laws required to regulate technology and AI. The goal of the strategy should be to identify which laws need to be issued or amended, and to determine the timing of their issuance[23]".*

In this regard, Dr. Hoda Baraka affirmed that:

> *"The AI law drafting committee is studying and analyzing other related laws".*

In conclusion, while Egypt's current legislative framework provides a foundation for regulating certain aspects of AI—such as data protection, cybersecurity, and intellectual property—it does not yet fully address the unique ethical, legal, and societal challenges posed by AI technologies. As such, it is both timely and necessary to assess the effectiveness of existing laws and to continue developing dedicated AI law to ensure comprehensive and future-ready regulation.

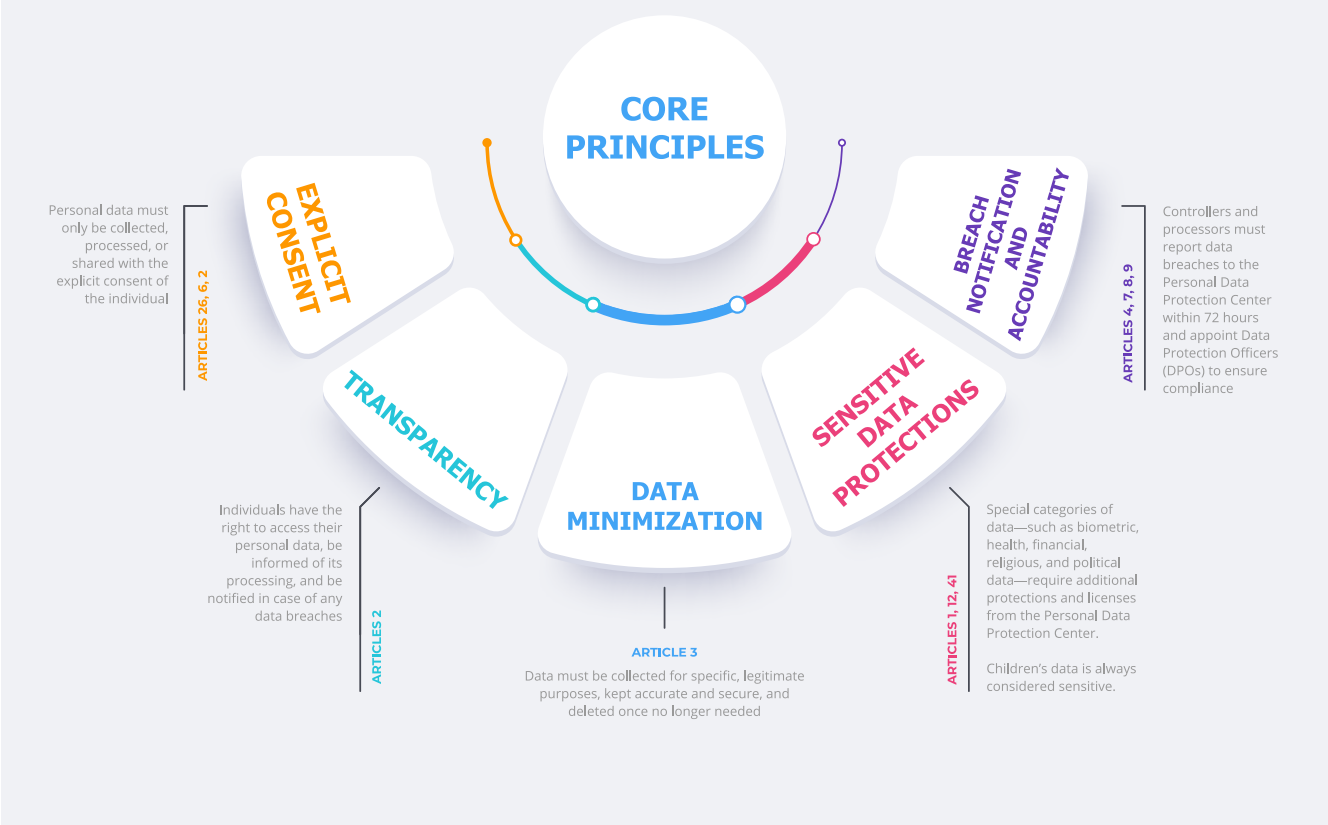
Data protection and privacy laws

In 2020, Egypt enacted the Personal Data Protection Law (PDPL), Law No. 151 of 2020, to establish a comprehensive legal framework for the protection of personal data. The law sets clear requirements for consent-based data processing, outlines the rights of data subjects, and mandates institutional mechanisms for enforcement.

[22]. *Interview with Dr. Hoda Baraka the Advisor to Minister of communication and Information Technology for Technology Talents Development, 9 April, 2025.*
[23] *Interview with Noha Fathy , Internet Governance Consultant , 9 April , 2025.*

Legal Framework and Core Principles

The PDPL is grounded in several key principles:



Institutional mechanism: The Personal Data Protection Center

Article 19 of the PDPL calls for the establishment of the Personal Data Protection Center, a public economic authority responsible for enforcing the law, issuing licenses, receiving complaints, and coordinating national policies on personal data protection.

According to Ms. Suzanne El-Kbaoui, Advisor to the ICT Minister on Data Governance:

> *"The executive regulation of the Data Protection Law has been drafted and is in the process of official issuance and publication; regarding AI applications, the executive regulation discusses data processing by AI systems."*

She also stated:

> *"The center has already been established, and we are waiting for the official announcement of its establishment."*

However, as of the time of writing, both the executive regulations and the formal launch of the Center remain pending, limiting the full implementation of the PDPL.

Constitutional and Legal Context

The PDPL is reinforced by broader constitutional guarantees:

- **Article 57 of the 2014 Constitution:**
  Guarantees the right to privacy and the confidentiality of communication.

- **Article 99:**
  Treats violations of private life as crimes with no statute of limitations and guarantees compensation.

- **Law No.175 of 2018 (Cybercrimes Law) and Law No.180 of 2018 (Media Law):**
  Further criminalize digital privacy violations and unauthorized dissemination of personal data.

Enforcement and Penalties

Articles 33 to 37 provide for judicial resources, allowing affected individuals to file complaints and lawsuits. Fines range from EGP 100,000 to 5 million and include criminal penalties for unauthorized use of sensitive or personal data.

While Egypt's PDPL aligns with international best practices and reflects a strong legislative commitment to data protection, its effectiveness is constrained by the lack of executive regulations and an operational regulatory authority.

Accelerating the issuance of the regulations and the official launch of the Personal Data Protection Center is essential to operationalize the law and provide meaningful safeguards for personal data in the digital era.

Data sharing and accessibility

This section focuses on data governance in general. All AI systems rely heavily on data and data sharing is essential to their development and functionality.

In July 2013, G8 leaders signed the G8 Open Data Charter, outlining five core principles for how data can support transparency, innovation, and accountability.
While the Charter was welcomed by many governments and advocates, there was general consensus that the principles could be refined to support broader global adoption[24].
This led to the launch of the International Open Data Charter (ODC) at the 2015 United Nations General Assembly[25].
Governments that adopt the ODC commit to implementing open data policies that ensure data is accessible and freely available, while protecting the rights of individuals and communities. Egypt has not yet adopted the ODC.

[24] *Opening data charter-ODC https://opendatacharter.net/adopt-the-charter/.*
[25] *.Opening data charter-ODC https://opendatacharter.net/adopt-the-charter/*

Article 68 of the 2014 Egyptian Constitution states:

> *"Information, data, statistics, and official documents belong to the People and the disclosure thereof from their various sources is a right guaranteed by the State for all citizens. The state is committed to provide and make them available to citizens in a transparent manner."*[26]

The Open Data Inventory (ODIN) measures how complete a country's statistical offerings are and whether their data meets international openness standards. In ODIN 2022, Egypt ranked 130 out of 195 countries, with an overall score of 41. The overall score is a combination of a data coverage sub score of 52 and a data openness sub score of 31. This ranking highlights the need for improvements in both the availability and openness of national data[27].

Data sharing framework

Although Article 68 of the Egyptian Constitution 2014 states that the law will regulate the accessing and sharing of data, Egypt currently lacks a comprehensive legal framework or dedicated legislation to enforce this right.

According to the Global Data Barometer, Egypt has made "noticeable improvements" in sharing data online and promoting open access. The government has advanced transparency efforts by making official datasets available for public use at any time and for various purposes[28].

Significant strides have been made through platforms such as:

1. **The Egyptian National Accounts Data**[29], which provides interactive datasets related to Gross Domestic Product (GDP), growth rates, and investments.
2. **The Egypt Data Portal**[30], offering a wealth sectoral data across agriculture, education, finance, industry, health, labor, population, prices, tourism, trade, and transport.

One big setback at this current moment is the absence of a unified legal framework to regulate data processing, safeguard rights and responsibilities, and sustain data sharing across sectors. While there have been promising efforts, particularly by the MCIT, these remain fragmented. These efforts would be significantly more effective if supported by a comprehensive legal framework developed in collaboration with other relevant stakeholders.

One of the most critical missing elements is the Access to Information law, which has not been enacted. The issuance of this law is one of the highly recommended actions needed for the development of AI systems in Egypt. Ms Maha Abdel Naser, Member of Egyptian Parliament and a member of the Communication and Information Technology committee, emphasized:

[26] *Article (68), Egyptian Constitution 2014, https://www.sis.gov.eg/up/dustor/dustor-english002.pdf*
[27] *. Open Data Inventory (ODIN), (2022). Egypt, p.1.*
[28] *Global Data Barometer, https://globaldatabarometer.org/country/egypt/*
[29] *National Data Account, https://mped.gov.eg/Analytics?lang=en*
[30] *Egypt Data Portal, https://egypt.opendataforafrica.org*

> *"It is important to adopt a data classification law which will identify the type of information that could be shared[31]".*

She further added:

> *"On the one hand, adopting an access to information law and data classification law are essential for the usage of AI; on the other hand, adopting these laws will encourage international companies to invest in AI development in Egypt, especially as Egypt possesses a huge amount of data due the size of its population, and social and cultural diversity."*

Government data policies

According to the Global Data Barometer, the Egyptian Open Data Initiative was launched in 2015 with the aim of making data publicly accessible and visible. However, the initiative's designated website has not been updated for a considerable period, raising concerns about its credibility and relevance. his lack of clarity contributes to the perception that Egypt's open data efforts are disorganized and not clearly articulated in an official capacity. Although a government-led open data initiative exists, there is limited recent evidence of sustained activity.[32]

On the contrary, other platforms — such as the National Accounts Data and the Egypt Data Portal — offer more credible, regularly updated, and verified datasets, and have emerged as more reliable sources of government data.

Procurement laws and policies

Clear guidance is essential to ensure that AI procurement processes are accountable, transparent, and aligned with public interest.

At present, Egypt does not have specific laws or regulations governing the procurement of AI systems. In principle, AI procurement could fall under Law No.182 of 2018, which governs public contracts and procurement. However, the lack of explicit legal provisions tailored to AI poses challenges, particularly as governments increasingly deploy AI in public-sector operations.

Without clear guidance on how to ensure accountability, transparency and explainability, governments risk failing to meet public expectations. The lack of expert and democratic oversight may also lead to unintended consequences, including algorithmic bias, harm to citizens, or violation of data protection norms.

To address these concerns, it is highly recommended that a new law be enacted, or addendums added to existing procurement legislation, to specifically regulate the acquisition and use of AI systems in the public sector.

[31]. *Interview with Maha Abdel Naser - Member of Egyptian Parliament and member of the committee for Communication and Information Technology, 9 April 2025.*
[32]. *Global Data Barometer, https://globaldatabarometer.org/country/egypt/*

According to the World Economic Forum, effective AI procurement policies should:

- Use procurement processes that focus not on prescribing a specific solution but rather on outlining problems and opportunities, and allow room for iteration
- Define the public benefit of using AI while assessing risks
- Align your procurement with relevant existing governmental strategies and contribute to their further improvement
- Take into consideration the appropriate confidentiality, trade-secret protection, and data-privacy best practices that may be relevant to the deployment of the AI systems[33].

Freedom of information acts/access to knowledge acts

Article 68 of the Egyptian Constitution 2014 guarantees the right of citizens to access information, stating[35]:

> *"Information, data, statistics, and official documents belong to the People, and the disclosure thereof from their various sources is a right guaranteed by the State for all citizens. The State is committed to providing them and making them available to citizens in a transparent manner."*

The article further mandates that legislation must regulate the terms of access, availability, confidentiality, storage, and procedures for lodging complaints in cases of refusal. It also requires penalties for withholding or falsifying information and obliges state institutions to safeguard and deposit official documents with the National Library and Archives.

Despite this constitutional commitment, Egypt has not enacted a dedicated Freedom of Information Law or an Access to Knowledge Act. The absence of such legislation means that access to public sector data, including information related to AI systems and digital technology. Remain limited and largely unregulated.

Establishing a comprehensive access to information law is essential to operationalize constitutional guarantees, enhance transparency, and support ethical AI governance through public accountability

Due process and accountability

In addition to the rights protected by the Constitution, Egypt has a legal framework that upholds due process and individual rights through various laws, including, and not limited to: civil law, criminal law, personal data protection law, and cybercrime law.

[33].World Economic Forum, AI Procurement in a Box: AI Government Procurement Guidelines, 2020. P.11. https://www3.weforum.org/docs/WEF_AI_Procurement_in_a_Box_AI_Government_Procurement_Guidelines_2020.pdf

[35] Egyptian Constitution 2014, Article (68), https://www.sis.gov.eg/up/dustor/dustor-english002.pdf

The 2023 Egyptian Charter for Responsible AI acknowledges the implications of AI for human rights. It explicitly affirms that:

> *"Any end user has the fundamental right to know when he or she is interacting with an AI system rather than with a human, for example, in the case of automated call centers."*[36]

Although no specific law currently addresses violations or harm caused by AI systems, Egypt's civil law, particularly under tort provisions, provides individuals with the right to seek compensation for harm suffered. This principle may offer a legal basis for accountability in cases where AI systems cause direct damage to individuals.

Online safety and integrity of speech

Egypt has specific policies addressing violent content, online hate speech, and the dissemination of misinformation and disinformation. Article 102 (Bis) of the Penal Code criminalizes the intentional broadcasting of false news, statements, or rumors that may disturb public security, spread terror among the population, or harm the public interest.

In addition, Law No. 180 of 2018, which regulates the Press, Media, and the Supreme Council for Media, includes several provisions related to content integrity:

- **ARTICLE 19:** Prohibits any newspaper, media outlet, or website from publishing or broadcasting false news, content that incites violations, violence, or hatred; promotes discrimination or racism, or attacks on an individual's honor through slander or insult. It also prohibits content that insults the three heavenly religions
- **ARTICLE 4:** Forbids the dissemination of any material or advertisements that contradict the Constitution, promote unlawful behavior, violate the professional code of conduct, or incite discrimination, violence, or racism.
- **ARTICLE 5:** Explicitly states that it is prohibited to establish or operate any media outlet, newspaper, or website that is based on religious, sectarian, gender-based, ethnic, or regional discrimination or fanaticism.

Furthermore, Article (31 of Law No.175 of 2018 on Anti-Cyber and Information Technology Crimes Law[37] holds the Service Providers accountable for maintaining the confidentiality of stored user data. It prohibits disclosure of personal or communications data without a valid judicial order, including data related to user activity or communication partners.

[36] *Egyptian charter for responsible AI,2023, p.3*
[37] *Anti-Cyber and Information Technology Crimes Law, Law No. 175 of 2018, Article (31),* https://cybercrime-fr.org/wp-content/uploads/2020/04/Egyptian-cybercrime-law-.pdf

Despite these comprehensive legal measures addressing online speech and media integrity, Egypt currently lacks specific laws or policies that regulate the impact of artificial intelligence on digital platforms. Key areas that remain unaddressed include AI-generated misinformation and disinformation, the algorithmic amplification of hate speech, transparency in content moderation processes, and the accountability of AI systems operating within social media environments. Given the increasing influence of AI technologies in shaping public discourse and information flows, these gaps represent critical areas for future legislative and policy development.

Public sector capacity

Egypt is actively strengthening public sector capacity in the field of AI. According to MCIT, the national capacity building framework is structured around two key tracks: one for technical roles, and one for non-technical roles.

The technical track prioritizes roles based on industry demand, ensuring that the AI work force is aligned with sectoral needs. The non-technical track focuses on equipping individual to effectively use AI in various domains. This begins with public awareness and education, followed by school-level education and teacher training, and progresses to higher education, where AI-related content is integrated into curricula of non-STEM and non-tech majors.[38]

Key national initiatives, and strategies, such as NAIS, prioritize the development of human capital and the investment in AI research by fostering partnerships between government and private entities. These efforts aims to prepare the Egyptian population at all levels for the emerging for the Age of AI, through the combination of public awareness campaigns, formal education reforms, and targeted professional training for both technical and non-technical public awareness campaigns, formal education reforms, and targeted professional training for both technical and non-technical disciplines.

Investment in capacity-building programs has risen significantly. Assignificantly. As of 2020/2023, the government had announced plans tohas trained over 115,000 225000 individuals through various technology-focused programs, costing 1.3 million Egyptian pounds[39].

[38] *MCIT, "How Government Plans to Grow AI Sector", Paragraph 12, 28 March 2022, https://mcit.gov.eg/upcont/mediacenter/mcit%20in%20press328202200how_government_plans_to_grow_ai_sector1.pdf*
[39] *Mr Ahmed Said, Minister advisor for economic and statistical affairs, MCIT*

In summary, the legal and institutional analysis indicates that Egypt has taken meaningful steps toward establishing a foundation for AI governance, particularly through general legislation such as the Personal Data Protection Law, the Cybercrime Law, and constitutional guarantees of privacy and access to information. While Egypt does not yet have dedicated national legislation on AI, some existing laws offer partial coverage for regulating the use of AI and mitigating its harms. However, the analysis also reveals important legal and regulatory gaps, particularly in areas such as AI procurement, algorithmic accountability, content moderation, intergovernmental data sharing, and transparency. Furthermore, the lack of enforceable executive regulations and the absence of a unified data-sharing or access-to-information law pose additional challenges to AI readiness.

Therefore, while foundational elements are in place, significant more legal and institutional reforms are still required to ensure that AI development and deployment in Egypt is ethical, transparent, and aligned with international best practices. These critical needs are further detailed in the final section of this report (Key Findings and Recommendations).

SOCIAL/CULTURAL DIMENSION

Background

This section provides an overview of Egypt's digital landscape, with a focus on social and cultural factors that influence AI readiness. It examines gender and rural/urban gaps in internet usage, initiatives to promote digital and STEM (Science, Technology, Engineering, Mathematics) education for women, and the importance of diversity in AI workforce development. It also reviews national strategies for applying AI across key sectors, including agriculture, healthcare, and environmental sustainability.

The section highlights both governmental and private sector efforts to bridge digital divides, improve digital literacy, and promote inclusivity in the tech ecosystem. It also considers the importance of developing AI responsibly, while assessing its potential social and environmental impacts.

Diversity, inclusion and equality

Gender Gap in Internet Usage

As of April 2025, Egypt's population was estimated at 118,023,912[40]. Of this, 49.5% were female and 50.5% male[41]. In January 2025, Egypt had 96.3 million internet users, resulting in an internet penetration rate of 81.9%[42]. Between January 2024 and January 2025, the number of internet users increased by 12 million (+14.6%)[43].

However, a significant digital gender gap persists. While 79.3% of men use the internet, only 65.2% of women[44] do. This disparity was reflected in Egypt's Gender Parity Score of 0.960 as of August 2023[45]. On social media, 41.5% of users were women compared to 58.5% who were men.

Rural/ Urban Gap in Internet Usage:

In 41% ,2024 of Egypt's population lived in urban areas, while 59% resided in rural areas[46] . Internet access remains uneven:

- Urban internet usage: 81%
- Rural internet usage: 68.1%

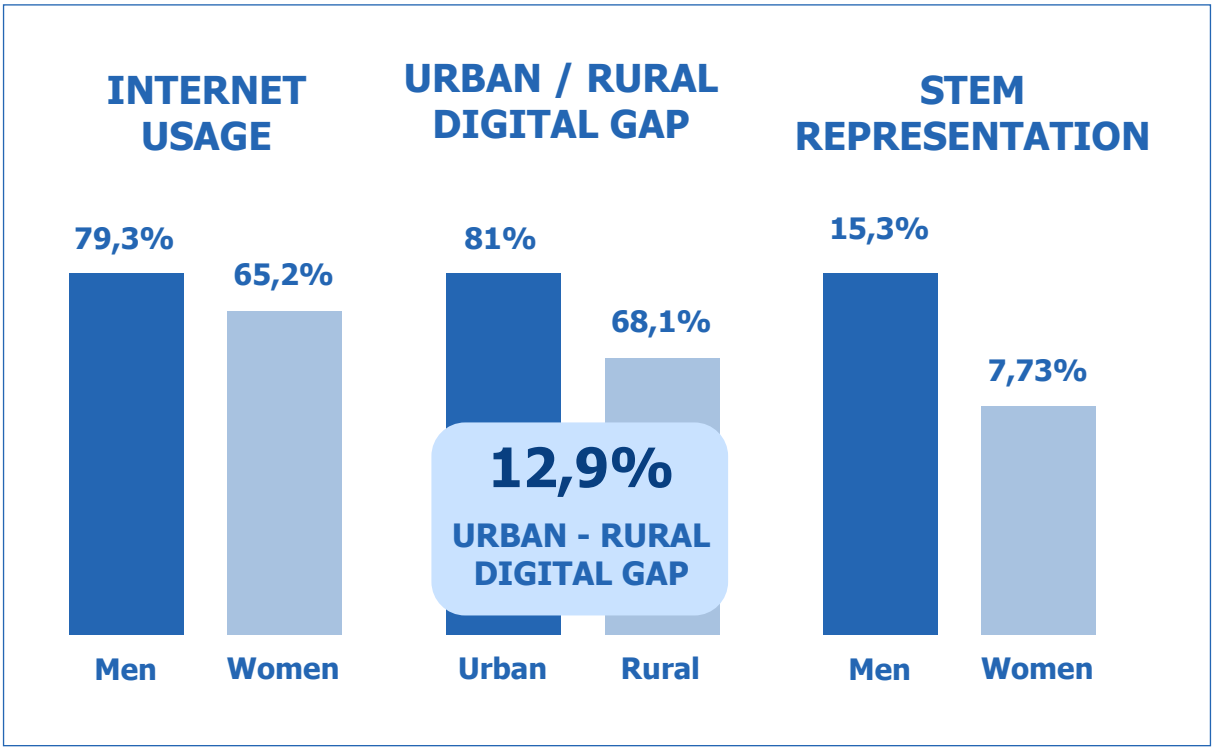
[40] *Worldometers, Egypt , https://www.worldometers.info/world-population/egypt-population/*
[41] *Data Reportal , Egypt 2025, https://datareportal.com/reports/digital-2025-egypt*
[42] *Data Reportal , Egypt 2025, https://datareportal.com/reports/digital-2025-egypt*
[43] *Data Reportal , Egypt 2025, https://datareportal.com/reports/digital-2025-egypt*
[44] *. Ministry of Communications and Information Technology. (2021-2022). Survey of ICT usage in household and individuals. Retrieved from: https://mcit.gov.eg/Upcont/Documents/Publications_1272023000_ICT_Indicators_Quarterly_Bulletin_Q1_2023.pdf*
[45] *. University of Oxford. (2023, August). Digital Gender Gap. Retrieved from https://www.digitalgendergaps.org/*
[46] *. Worldometers, Egypt, https://www.worldometers.info/demographics/egypt-demographics/#urb*

This reveals a 12.9% gap in internet access between urban and rural populations, in favor of urban areas.

Gender Gap in STEM and Science Professions

There is also a gender disparity in STEM education. Only 7.73% of all female students are enrolled in STEM programs, compared to 15.3% of all male students, resulting in a gender gap of 7.57% percentage points[47]. In terms of employment, women aged 15 years and above working in scientific professions make up 38% of the workforce, while men constitute 62%[48], reflecting a gender gap of 24%, according to the Central Agency for Public Mobilization and Statistics (CAPMAS) 2022 quarterly bulletin,

FIG 2 Gender disparity in STEM education



Sources: The author, World Economic Forum. (2021, March). Global Gender Gap Report 2021. Retrieved from https://www3.weforum.org/docs/WEF_GGGR_2021.pdf & Central Agency for Public Mobilization and Statistics. (2023, February). Quarterly bulletin labor force survey, fourth quarter, 2022 (No 2023-12211-67 P 46).

[47] *World Economic Forum. (2021, March). Global Gender Gap Report 2021. Retrieved from https://www3.weforum.org/docs/WEF_GGGR_2021.pdf*

[48] *Central Agency for Public Mobilization and Statistics. (2023, February). Quarterly bulletin labor force survey, fourth quarter, 2022 (No 67-12211-2023 P 46).*

Gender gap in business

According to the 2022 Women, Business and the Law Index, Egypt received a score of approximately 30 out of 100 for overall women's empowerment. The index assesses laws and regulations affecting women's economic inclusion across eight areas: mobility, workplace, pay, marriage, parenthood, entrepreneurship, assets, and pension. Notably, Egypt scored just 31 out of 100 for gender parity in highly skilled professions. This sheds light on the fact that women are underutilized in the Egyptian workforce, even if they are highly educated.[49]

Digital talent constitutes only 1.9% of full-time employees, and women are underrepresented. In Egypt, men are more prone to participate in entrepreneurship compared to women, with rates of 12.3% for men versus 9.2% for women[50]. Of 21 AI startups in 2021, only two were female-founded:

1. **Chefaa:** is a patient-centric, AI-powered platform that connects users with pharmacies across Egypt. The platform utilizes AI to enhance user experience and streamline the process of obtaining medications.
2. **Intella:** is an AI startup specializing in Arabic speech recognition and voice technology. The company focuses on developing deep tech solutions tailored for the Arabic-speaking market.

Reducing the digital gender gap:

Since 2017, the National Strategy for the Empowerment of Egyptian Women 2030 has emphasized the importance of digitization, technology, innovation, and financial inclusion as key enablers of women›s economic empowerment[51]. As part of this strategy, the Egyptian government has launched multiple initiatives aimed at equipping women with essential digital skills.

On major initiative is the 'Women in Technology' launched by the National Council for Women (NCW), in collaboration with Huawei. This initiative seeks to support and empower Egyptian women and girls by enhancing their participation in the communications and information technology sector[52]. It also promotes awareness of gender equality through storytelling and sharing experiences of women in tech (SIS, 2023).
The initiative is structured around three key projects:

1. **Technology for Her**
2. **Technology Alongside Her**
3. **Technology Created by Her**

[49] *OECD (2024), OECD Artificial Intelligence Review of Egypt, OECD Publishing, Paris, https://doi.org/10.1787/2a282726-en.*
[50] *OECD, 2024), OECD Artificial Intelligence Review of Egypt, OECD Publishing, Paris, p.44.*
[51] *National Council for Women. (2017). National Strategy for the Empowerment of Egyptian Women 2030. Retrieved from https://ncw.gov.eg/images/PdfRelease/final-version-national-strateg-10202312133058257.pdf*
[52] *ESCWA. (2021, October 31). Challenges to women's empowerment in technology and entrepreneurship: Egypt. Retrieved from https://www.unescwa.org/events/challenges-women%E2%80%99s-empowerment-technology-and-entrepreneurship-egypt*

Each project includes a range of training sessions tailored to women at various stages of their professional journey. Participants receive certification from Huawei, in partnership with the NWC, and are expected to serve as a role model for other women pursuing careers in the IT industry[53].

In addition to this, MCIT has launched two complementary programmes:

1. **Qodwa Tech:** to empower women digitally[54], and
2. **She is a Pioneer:** which seeks to support female entrepreneurs in establishing companies based broadly in the communications and IT sector [55].

These initiatives collectively contribute to closing the digital gender gap, increasing women›s access to digital tools, and fostering their participation in Egypt's growing digital economy.

Reducing the digital socioeconomic and rural-urban gap:

Dr. Amr Talaat, the Minister of the MCIT, announced the implementation of a series of programs within the framework of the presidential initiative 'A Decent Life' or 'Haya Kareema'. These programs aim to enhance digital awareness and digital economic empowerment for citizens in rural villages.

Key objectives include:

- Eradicating digital illiteracy
- Enhancing the digital skills of Egypt's rural population
- Expanding communications infrastructure, such as the installation of fiber-optic networks and increased mobile phone coverage in target areas
- Establishing post offices to improve public access to services and promote human development[56].

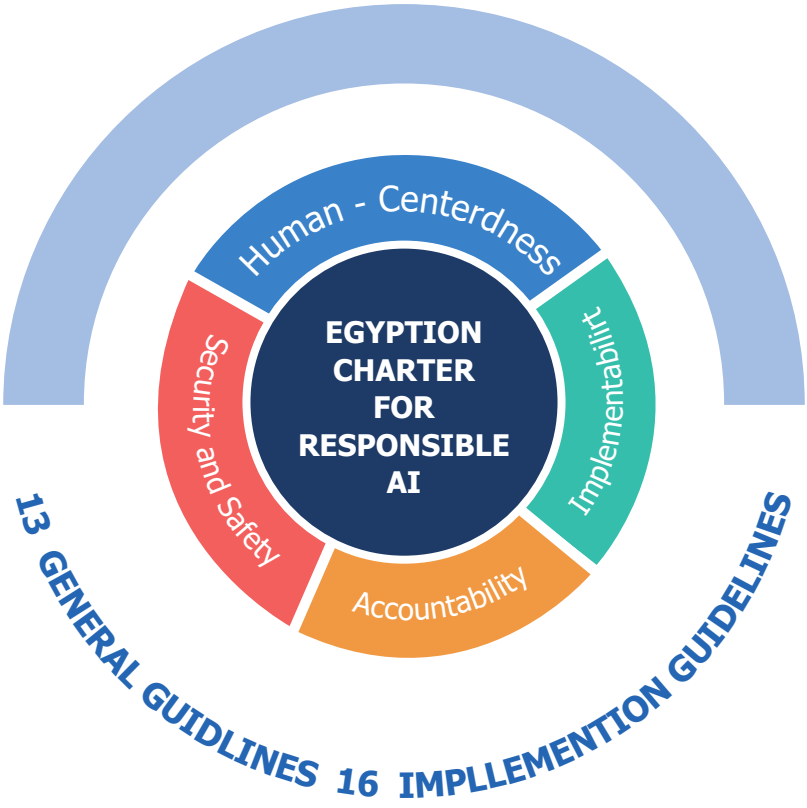
A central focus of these efforts is to empower rural women, enabling them to leverage technology to acquire new skills, expand their knowledge, and access quality employment and opportunities.

Enhance diversity in the AI workforce:

The Egyptian Charter for Responsible AI (2023) outlines five core values: Human-Centeredness, Transparency and Explainability, Fairness, Accountability, and Security and Safety. These values are supported by 13 General Guidelines and 16 Implementation Guidelines, applicable across the entire AI ecosystem.[57]

[53] *Daily News Egypt, 2023*
[54] *Qodwa Tech Initiative. Retrieved from https://www.qodwatech.com/*
[55] *Ministry of Communications and Information Technology. (2023). 'Decent Life' Presidential Initiative. Retrieved from https://mcit.gov.eg/en/decent_life*
[56] *. Ministry of Communications and Information Technology. (2023). 'Decent Life' Presidential Initiative. Retrieved from https://mcit.gov.eg/en/decent_life*
[57] *Ministry of Communications and Information Technology. Retrieved from https://aicm.ai.gov.eg/en/Resources/EgyptianCharterForResponsibleAIEnglish-v1.0.pdf*

Key Components of the Egyptian Charter for Responsible AI (2023)
Core Values and Guidelines Shaping Egypt's Ethical AI Ecosystem



Sources: The author, National Council for Artificial Intelligence. (2023). Egyptian Charter for Responsible AI (Version 1.0).

The charter implementation guidelines focus on expertise in Articles (7-4), mentioning the importance of expertise in AI development. For AI projects to transition successfully into production, they must be developed by entities with proven capabilities in delivering product-grade AI solutions. The development team should be diverse, including system architects, AIOps and QA engineers, cybersecurity specialists, software engineers (who work on the application or platform hosting the AI models), data scientists, AI engineers (whose specialty varies based on the project), at least one domain expert, and a project manager. Diversity in the team helps to ensure accountability.

Domain experts are crucial to AI teams as they deeply understand the business problem. They guide the team on data availability and quality and help ensure that AI outputs are relevant to the problem being addressed, further reinforcing accountability.

To ensure fairness, the charter also recommends that AI development teams, whether in government, the private sector, or academic/research institutions, include a representative sample of the intended beneficiaries of the AI system. This inclusion strengthens the system's relevance and promotes equitable outcomes.

Improving diversity throughout the AI life cycle:

Egypt's NAIS promotes cooperation between the government, public sector, academic institutions, and private sector. However, it does not explicitly address gender or geographic diversity, and there are currently no specific legal requirements mandating tech companies to publish diversity statistics.

Article 6 of the implementation guidelines for Egypt's Charter for Responsible AI states:

> *"Government entities, private companies, academic and research organizations, and any other entities developing AI systems should work with a representative sample of the beneficiaries of their AI systems.[58]"*

During the multistakeholder consultation meeting, which took place on the 22nd of April 2025, as part of the research for this report, the participants emphasized the urgent need to address algorithmic bias in AI systems. In particular, the discussion highlighted how women and marginalized groups are often disproportionately affected by the design, deployment, and use of AI technologies. To address these inequalities, the discussions emphasized the critical need for strong public-private partnerships and comprehensive education strategies that promote digital literacy, ethical awareness, and equitable participation in AI development. Inclusion must be intentional in AI policy, system design, and institutional governance—only then can AI become a tool for empowerment, not exclusion.

Public engagement and trust

Egypt shows a promising- yet uneven- landscape in the digital domain. According to the E-Government Development Index (EGDI), Egypt's Online Services Index stands at 0.6699 (score range from 0 to 1), placing the country 95 out of 193[59] . This indicates an intermediate level of development in the provision of electronic government services.

Egypt's E-Participation Index, which measures the extent of citizen engagement in digital policymaking, is slightly lower at 0.5890, ranking 74th out of 193[60] . While these rankings reflect progress, they also highlight the need to further invest in digital public services and inclusive digital governance.

[58]. *Article 6 , Egypt's Charter for Responsible AI*
[59]. *UNITED NATIONS E-GOVERNMENT SURVEY 2024, E-Government Development Index (EGDI) 2024,p 198,*
[60]. *UN E-Governance Knowledgebase, 2024, https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/53-Egypt*

Despite these moderate scores, public trust in government digital platforms and applications appears relatively strong, with 56%[61] of citizens expressing trust in the digital services provided by the government. However, there is a lack of publicly available data on the Egyptians' overall trust in AI and technology. This gap limits our understanding of the broader public perception of digital transformation and the ethical adoption of AI in the country.

This snapshot of Egypt's digital landscape underscores the progress made as well as the potential areas for further development, particularly in expanding public participation and building comprehensive trust in AI-driven innovation.

Environmental and sustainability policies

Currently, no standalone policy, law, or strategy directly addresses the environmental and sustainability implications of AI. However, Egypt›s NAIS includes provisions that highlight the potential environmental and agricultural benefits of AI implementation.

One notable example is in the field of agriculture, where AI can help optimizing pesticideoptimizing pesticide use. By leveraging computer vision, robotics, and machine learning, farmers can precisely target weed infestations, ensuring chemicals are applied only where necessary. This not only curtails excessive pesticide use but also reduces environmental tolls. Moreover, through collaborative partnerships and development projects, there will be a focus on assessing climate impacts, water flow patterns, data gathering methods, farm monitoring, efficient irrigation techniques, and the identification of crops that boost annual yields to their utmost potential.

Egypt's NAIS also aligned with the UN's Sustainable Development Goals (SDGs), by promoting the use of AI technologies to support objectives such as:

- Good health and well-being (SDG 3)
- Quality education (SDG 4)
- Gender equality (SDG 5)
- Industry, innovation, and infrastructure (SDG 9)
- Sustainable cities and communities (SDG 11)

The strategy emphasizes leveraging AI to address Egypt-specific challenges while contributing to these broader global goals. This includes using AI for improving public services, enhancing economic sectors, or addressing environmental concerns specific to the region.

[61]. *(Economist Impact, 2022),*

In 2014, a memorandum titled 'Green ICT' was signed by the Minister of Communications and Information Technology, and the Minister of State for Environmental Affairs. This Memorandum of Understanding aims to overcome the challenges and prospects associated with ICT. Its objective is to mitigate the environmental impacts stemming from the proliferation of ICT, while harnessing its capabilities to diminish emissions from various sectors. This agreement is anchored in three pivotal programs[62]:

1. Public education on Green ICT
2. E-waste management
3. ICT innovation for sustainability

Additionally, Egypt has turned to AI-based technologies for weather forecasting and sandstorm predictionprediction. There is a collaboration between MCIT and the Egyptian Meteorological Authority to implement joint projects using AI technologies, particularly in areas related to preparedness for natural disasters and climate change. The aim of this collaboration is to develop services in the field of meteorology and weather forecasting, relying on data analysisanalysis and information systems[63]

However, the use and deployment of AI technologies in Egypt may not be subject to stringent environmental oversight or evaluation regarding their energy consumption and this may lead to consequences for the environment due to the lack of organised efforts.

During the national multistakeholder consultation meeting, which took place on the 22nd of April 2025, participants identified key environmental challenges that could affect Egypt's AI readiness:

1. Fragmented environmental data limits the effectiveness of AI tools for sustainabilitya
2. High-quality, long-term historical datasets are essential, requiring a national campaign to digitize records that could improve AI modeling
3. Building trust and engagement among stakeholders and decision-makers is vital for ensuring equitable access to AI tools in the environmental domain.

[62]. *Ministry of Communications and Information Technology. (2021, December 14). MCIT, Civil Aviation Ministry Cooperate in IT, AI-Powered Projects. Retrieved from https://mcit.gov.eg/en/Media_Center/Press_Room/Press_Releases/64852*
[63]. *Idem*

Health and social wellbeing

Although Egypt does not currently have a specific digital health policy, the digital health sector is experiencing significant growth and development, particularly in areas such as AI, mobile computing, and wearable devices aimed at improving healthcare efficiency and quality.
Healthcare is explicitly identified as a key priority under Egypt's NAIS, reflecting a commitment to integrating digital and AI technologies in the healthcare system. According to MCIT:

> "The Applied Innovation Center (AIC), affiliated to MCIT, is collaborating with Alexandria University in carrying out a joint project for developing a system that will help detect early signs of diabetic retinopathy, capitalizing on digital mechanisms and AI-powered fundus imaging and image analysis. This comes within MCIT strategy for building Digital Egypt. As a pilot project, a campaign was launched in Alexandria for detecting early signs of diabetic retinopathy capitalizing on AI, targeting 10,000-7,000 people with diabetes. The system is to be applied on a large scale nationwide after being developed.[64]"

Additionally, AI has the potential to assist healthcare professionals in a wide range of areas such as: chronic disease management, mental health support, addressing social issues including domestic violence and addiction, pediatric triage, drug-drug interaction analysis, and the establishment of an Egyptian biobank.

Although the Egyptian Charter for Responsible AI explicitly emphasizes the importance of protecting individuals, especially children, from harm caused by the AI systems, it does not provide detailed policy guidelines or frameworks in order to specifically address the impact of AI on children.

CULTURE

There is currently no specific policy in Egypt regarding the use of AI in the preservation of cultural heritage. However, the Egyptian Charter for Responsible AI acknowledges the country's rich cultural heritage and dynamic present, and it encourages AI system developers, particularly those working on Natural Language Processing (NLP applications like automated translation and voice assistants, to consider the cultural implications of these systems.

MCIT is working on a national initiative «The Egypt Digital Heritage Portal» designed to document, preserve, and present Egypt's cultural heritage through a unified digital platform. It integrates advanced technologies including AI, optical character recognition, and smart search to enable public access, academic research, and cultural education

[64].MCIT, https://mcit.gov.eg/en/Media_Center/Latest_News/News/63214

These technologies are significantly influenced by the subtleties of human language and expression, making it essential to integrate cultural sensitivity into their design and implementation. The aim is to maximize the benefits of these systems by bridging cultural divides and enhancing human understanding.

At the same time, developers are advised to minimize adverse effects, such as reduced usage of AI applications that could contribute to the loss of endangered languages, local dialects, and the tonal and cultural nuances inherent in human language and expression, in the pursuit of fairness.

Although Egyptian society is largely linguistically and culturally homogenous, there are recognized minorities and indigenous languages, including the Nubian, Bedouin Arabic dialects, Siwi (Berber), and Coptic. However, most members of these communities can speak and understand Modern Standard Arabic, and many of these indigenous languages are no longer used in daily communication. As a result, these languages received limited attention in national discussions on AI development and language technologies.

Notably, the second edition of NSAI does place strategic emphasis on the development of Arabic language technologies. One of its key initiatives is the creation of a large-scale national Arabic language model aimed at enhancing capabilities in machine translation, sentiment analysis, and content generation. The strategy also designates Arabic NLP as a priority sector during its initial phase, underscoring Egypt's intent to expand the accessibility and relevance of AI in the native language.

While this is a significant step toward localizing AI technologies, the linguistic diversity within Egypt remains largely underrepresented. Incorporating minority languages and dialects into AI development could further enrich Egypt's digital ecosystem and support the broader goal of cultural preservation through inclusive technology.

Egypt is currently laying the groundwork for a national strategy to integrate AI into the cultural sector, with formal adoption planned for 2026. In the interim, the Ministry of Culture (MoC) has begun experimenting with several pilot initiatives aimed at balancing innovation with the need to preserve authenticity. As described by Dr. Rania Moustafa Abdel-Latif, Head of the International Cultural Relations Department in MoC, efforts are underway to digitize Egypt's tangible and intangible cultural heritage through tools such as 3D scanning, AI-supported documentation, and the creation of an interactive cultural map. These projects focus on improving accessibility and archiving local expressions, including regional dialects, folk traditions, and artistic practices—particularly in historically underrepresented regions like Sinai and southern Egypt.

This early-stage experimentation is also visible in the museum sector. At the Egyptian Museum in Tahrir, AI is being cautiously integrated to support visitor engagement, research, and conservation. Dr. Ali Abdelhaliem, Director of the museum, noted that while maintaining the authenticity of exhibits remains a priority, the museum has begun deploying virtual and

augmented reality in select exhibitions to meet evolving public expectations, especially among younger audiences. Additionally, AI is being tested in audience analysis and environmental monitoring, providing insights into how to tailor experiences while safeguarding collections. These steps reflect a pragmatic approach—exploring the utility of AI without fully displacing traditional curatorial methods.

Despite these promising developments, the integration of AI into Egypt's cultural infrastructure remains uneven. Limited digital infrastructure in border governorates, concerns around cultural decontextualization, and the risk of diluting creative voices are among the challenges repeatedly emphasized by both ministry officials and museum professionals. There is also an ongoing tension between the potential of AI to democratize cultural access and the need to regulate its impact on authorship, rights protection, and artistic originality. Current efforts, while meaningful, are preliminary and often depend on institutional collaborations or external support. The forthcoming 2026 strategy aims to provide a clearer roadmap for addressing these gaps and aligning Egypt's digital cultural policy with international standards.

Egypt has made meaningful strides in leveraging AI to promote inclusion and reduce gender disparities, particularly through targeted training initiatives and national strategies. However, significant challenges remain. Continued efforts are needed to ensure the ethical and equitable use of AI, including addressing gender imbalances, extending digital connectivity to all citizens, and bridging the urban-rural digital divide. The integration of environmental sustainability goals into Egypt's AI ecosystem also remains limited and warrants greater attention.

In the cultural domain, early initiatives are underway to digitize Egypt's tangible and intangible heritage, develop interactive cultural maps, and apply AI in museums to support preservation and visitor engagement. These efforts aim to document regional traditions and safeguard underrepresented Arabic dialects, but face constraints related to infrastructure, resource gaps, and the risk of cultural decontextualization. Strengthening institutional frameworks and ethical safeguards will be essential to ensure AI enhances, rather than diminishes, Egypt's rich cultural heritage.

SCIENTIFIC/EDUCATIONAL DIMENSION

Background

Education and scientific research are crucial for any country aiming to be globally competitive. AI is increasingly significant in these fields, serving as a powerful tool with the potential to revolutionize research and education. It accelerates scientific progress and enhances educational outcomes for all students. AI can transform the ways in which we learn, teach, and assess performance by offering personalized learning experiences and automating administrative tasks. AI tools are reshaping the research landscape for students and professionals. This not only improves the quality of education and scientific research but also strives to make it more accessible and equitable.

Indicators for the scientific and educational dimensions are vital for several reasons. They enable government and institutions to monitor and evaluate progress, inform policy making, and foster continuous improvement. Well-designed indicators also help to measure the real-world impact of scientific and educational initiatives, ensuring these sectors effectively contribute to societal growth and development.

Research and innovation

AI is transforming research and innovation by improving data analysis, streamlining processes, and facilitating new discoveries across various fields. As a powerful catalyst, AI boosts research capabilities and accelerates scientific and technological progress.

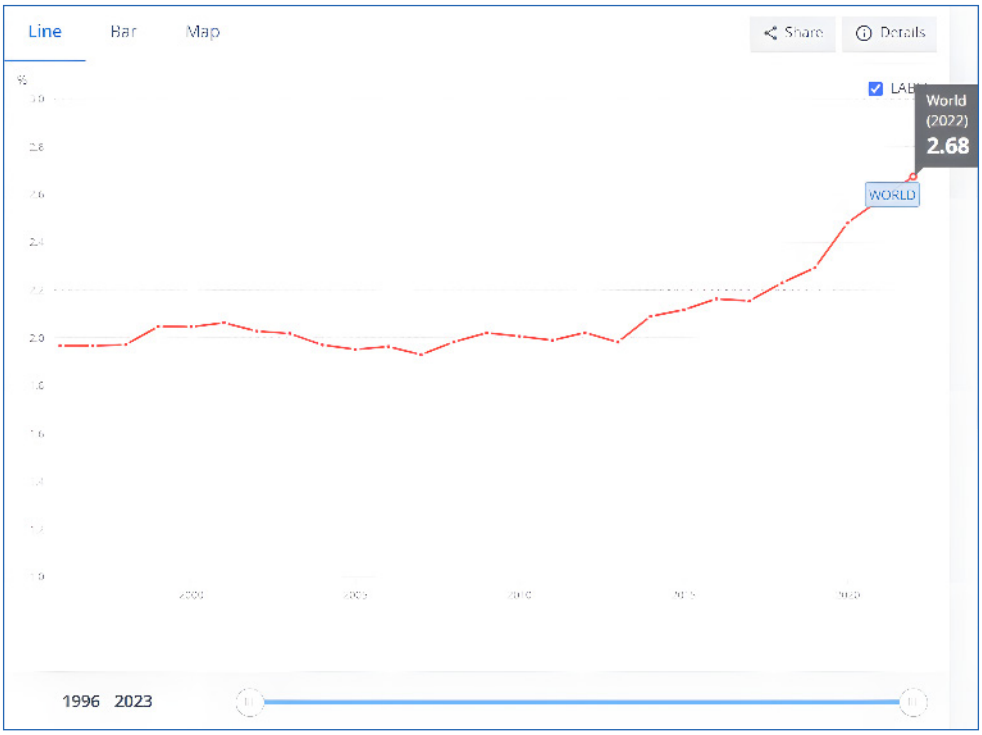
In terms of Research and Development (R&D) expenditure, the World Bank reported that, in 2022[65] , the average Gross Expenditure on Research and Development (GERD) as a percentage of GDP was 2.93% for high-income countries and 2.68% for all countries (Fig 3.). In comparison, Egypt's GERD as a share of GDP reached 1.1% in fiscal year 2024/2023 (Fig 4.), up from 1.02% in 2022 and 0.91% in 2021. This steady growth reflects the government's commitment to increasing investment in innovation and knowledge-based economic development.[66]

While this upward trend is encouraging, Egypt's GERD remains below the global average, highlighting the need for increased investment and stronger support for R&D initiatives, especially in AI-related domains.

[65] *As of May 2025, the most recent available data on global research and development (R&D) expenditure as a percentage of GDP is from 2022*

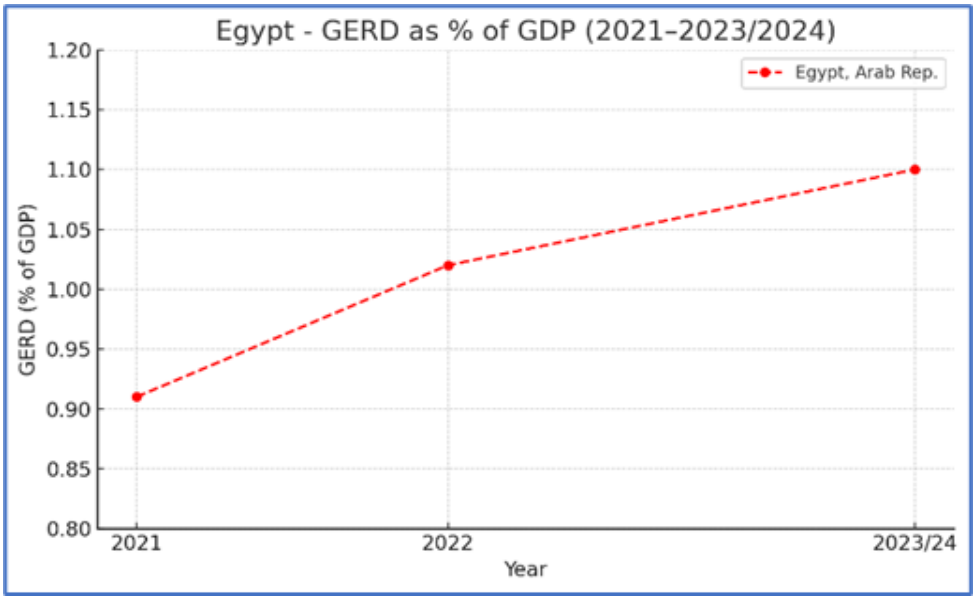
[66] https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS

FIG 3 **Research and development expenditure for all countriesin 2022 (% of GDP)**



Source : World Bank,
https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS

FIG 4 **Egypt's Research and Development Expenditure in 2024 (% of GDP)**



Source: : World Bank,
https://data.worldbank.org/indicator/GB.XPD.RSDV.GD.ZS?locations=EG

Research Funding in Egypt

Egypt receives research funding from a mix of public and private sources, including government allocations, business sector investments, private non-profit organizations, and foreign aid. While Egypt does not yet have many research initiatives that are directly dedicated to AI, there are many that are linked and would influence the field. Egypt ranks as the second-highest producer of scientific publications on the African continent. Since the 2007 restructuring of its research ecosystem, the country has experienceds significant growth as a hub for research and innovation. The following is a list of Egypt's most prominent funding agencies and a presentation of their main features.

1. **The European Union (EU)** plays a significant role by offering diverse funding aimed at supporting development, economic growth, and social initiatives. This includes grants and support for collaborative research projects in technology, science, and innovation. Many of these funds are channeled through EU programs such as the European Neighborhood Instrument (ENI), which specifically targets neighboring countries like Egypt to promote stability and prosperity.

2. **The Academy for Science and Technology (ASRT)** is Egypt's national academy and a key component of the Ministry of Scientific Research, which may operate independently or alongside the Ministry of Higher Education. ASRT serves as the country's center of expertise, advising the government on various science-related issues through its 14 specialized councils.

   One notable initiative is the 'Scientists of the Next Generation' grant, designed for students pursuing master's degrees who often self-fund their research. This grant is available exclusively to researchers under the age of 30. Additionally, ASRT is the main point of contact for bilateral research collaborations with advanced countries, managing several memoranda of understanding (MOUs) and matching funds agreements, including the Newton-Musharafa Fund.

3. **The Egyptian Science & Technology Development Fund (STDF)** provides targeted calls to support mission-oriented research aimed at addressing national challenges and offers various grants across the science, technology, and innovation (STI) ecosystem. Notable grants include reintegration grants for Egyptian diaspora scientists returning home and centers of excellence grants for establishing advanced research labs.

   Additionally, STDF fosters university-industry collaboration through initiatives like the Faculty for Factory Program, which compensates faculty members for their time spent on joint projects with industry.

According to Egypt's NAIS 2nd Edition (2025-2030), the Egyptian government aims to increase Gross Expenditure on Research and Development (GERD). By 2030, the ICT sector is expected to contribute 7.7% to Egypt's GDP. This initiative is part of a larger strategy to boost innovation, stimulate economic growth, and enhance competitiveness across multiple sectors.

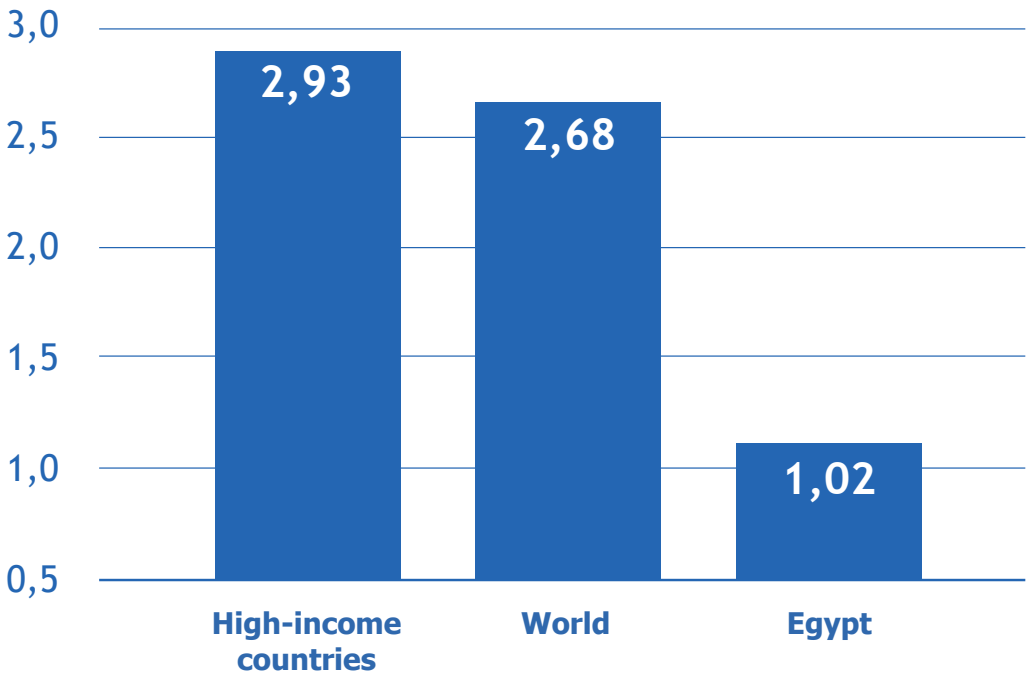
Several factors influence a country›s GERD in natural sciences and engineering as a share of GDP. These include:

- Government investment in research and development
- Private sector investment in research and development
- The level of economic development
- The country's cultural and historical commitment to research and development.

The government is prioritizing increased funding in key areas such as technology, healthcare, agriculture and renewable energy to drive innovation and economic growth.

According to the World Bank, Government Budget Allocations for R&D (GBARD) in USD in Egypt for 2022 totaled 1.5 billion USD. While this marks a step forward, it remains relatively low compared to other countries. Therefore, Egypt should further increase its investment in R&D to close the gap, strengthen its technological leadership and improve economic competitiveness.

FIG 5 **Research and Development Expenditure in 2022**

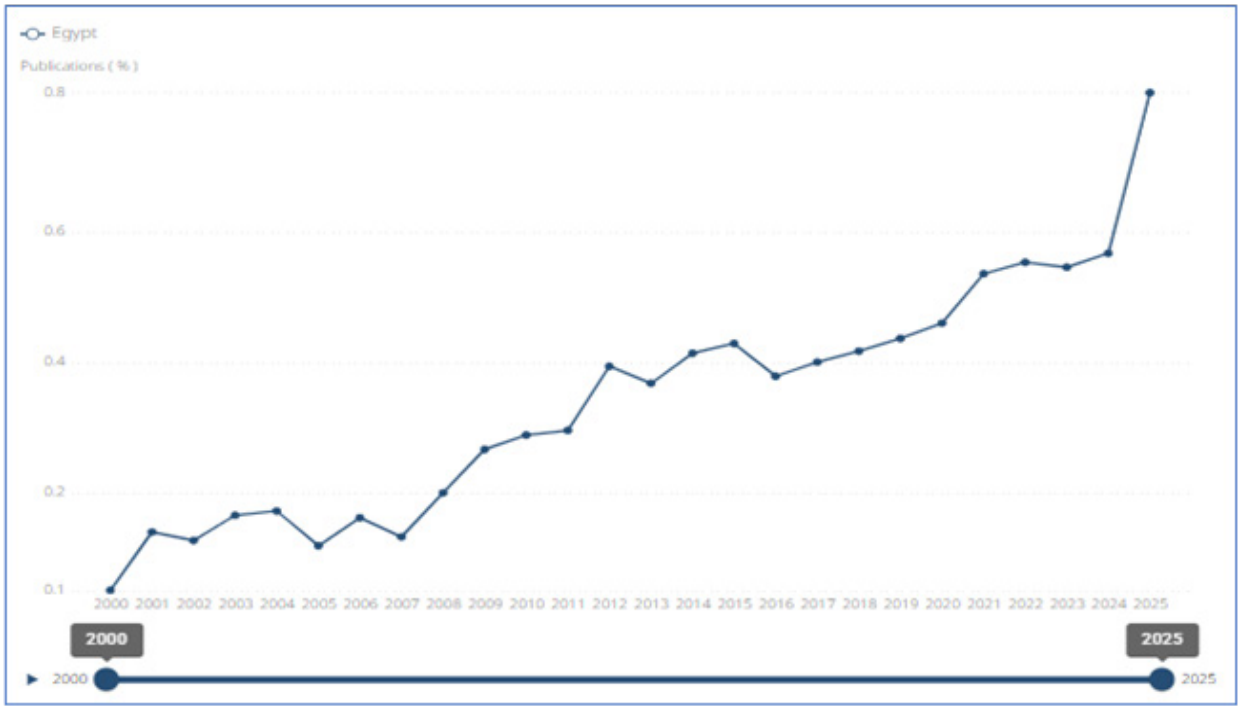


The Egyptian government targets to allocate 1.8 percent of GDP for spending on research and development (for the Ministry of Higher Education) in 2030, compared to about 1.2 percent in the current fiscal year 2024/2025. The percentage is expected to increase annually, as the government has set spending on research and development as a percentage of GDP at about 1.4 percent during the fiscal year 2026/2027, while it recorded 1.1 percent in 2023/2024[67].

Research Output

A key measure of progress in AI R&D is the volume of AI publications produced by different countries. Over the past decade, Egypt has experienced a steady increase in AI publications, reflecting a significant improvement in its research output. The following visualizations in Fig.6 based on data on AI publications from Open Alex and Scopus[68], provide detailed insights into the research activities occurring in Egypt.

FIG 6 **AI publications with Egypt's research output**



Resource: OECD.AI (2025), data from OpenAlex, last updated 31-03-2025

Egypt has increased its research output in AI, due to the growth of global AI research and its potential to address many of humanity's pressing challenges. Egypt is well-positioned to contribute meaningfully to this global effort. Several factors have contributed to the country's rising research, such as:

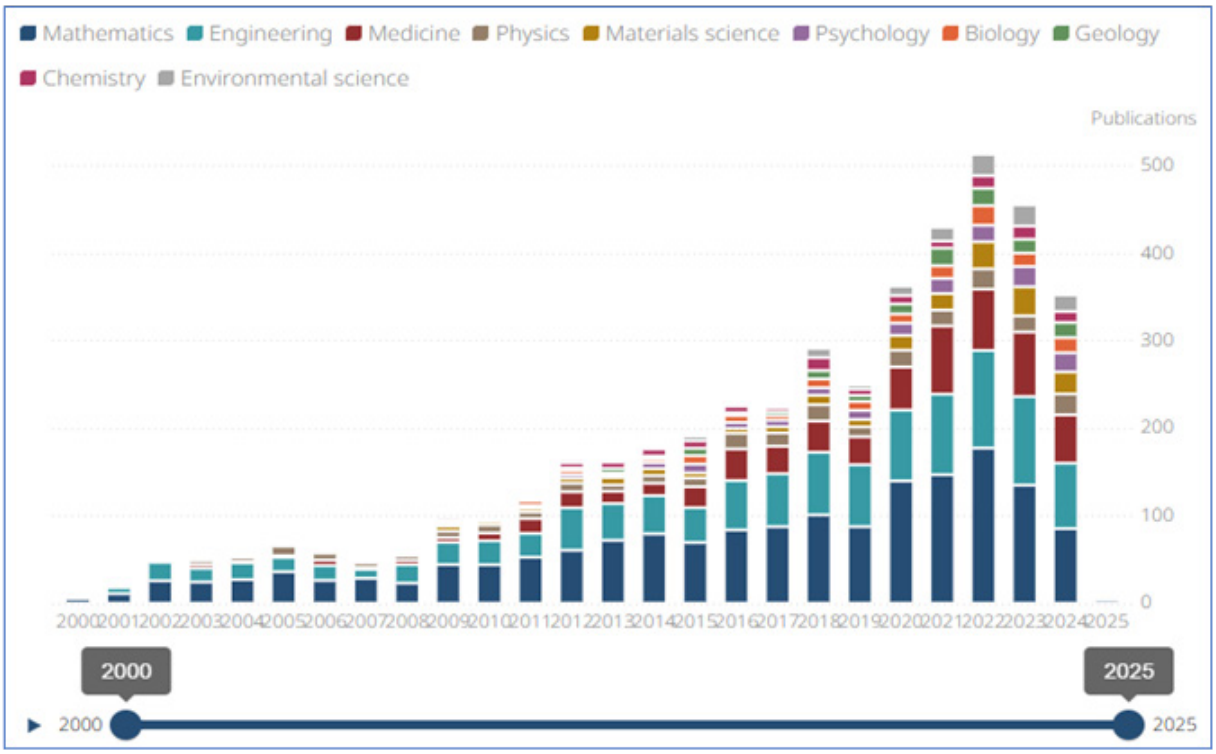
[67] https://www.egypttoday.com/Article/1/133901/Egypt-targets-to-spend-1-8-of-GDP-on-research?utm_source=chatgpt.com, Accessed 27/5/2025.
[68] OECD.AI (2025), data from OpenAlex, last updated 31 March 2025, accessed 19 April 2025. Available at: https://oecd.ai. Direct link to data visualization: OECD.AI AI Publications Time Series

- A Stronger emphasis on research across Egyptian universities
- Increased government funding for research
- Enhancements in research infrastructure
- Growing collaborations between Egyptian and international researchers

According to a 2023 report by MCIT, Egypt leads the Arab region in AI and AI-related research publications per capita, with 0.28 publications per 1,000 people. This is a significant achievement, given that Egypt's population exceeds 105 million people. Additionally, Egypt also ranks first in the region for AI and AI-related publications per capita, with 0.45 citations per 1,000 people, demonstrating the influence and quality of its research output.

AI publications from Egypt contribute significantly to the academic fields of mathematics, engineering, and medicine. The following chart in Fig.7 illustrates the distribution of high-impact AI-related publications across major academic disciplines in Egypt[69] .

FIG 7 **The number of AI-related publications across various academic disciplines in Egypt**



Resource: OECD.AI (2025), data from OpenAlex, last updated 31-03-2025

[69] *OECD.AI (2025), data from OpenAlex, last updated 2025-03-31, accessed on 2025-04-19. Available at: https://oecd.ai*

Egyptian AI researchers are making significant contributions across various key areas, showcasing the diverse impact of AI research in the country and fostering both technological advancement and societal development. These key areas are:

- **Healthcare:** Developing AI solutions for diagnostics, treatment recommendations, and patient management.

  o In Egypt's healthcare sector, the 'AI in Mammogram' project is a joint initiative by the Ministry of Communications and Information Technology's Applied Innovation Center (AIC) and the Bahya Foundation, an NGO supporting breast cancer patients. Launched in 2023, the project uses AI trained on anonymized data from 7,000 mammograms to help radiologists detect early-stage tumors, aiming to boost recovery rates to 98%. Funded mainly through donations, Bahya allocates 20% of its sustainable funds to support low-income patients.[70]

  o As part of the growing body of research and academic efforts in Egypt to enhance healthcare systems through digital transformation, a notable example is the paper titled "Future Applications of Artificial Intelligence for the Egyptian Universal Health Insurance System" by Imam, Soliman, and Abdel-Atty (2023).This article explores how artificial intelligence (AI) can be integrated into Egypt's Universal Health Insurance (UHI) system to improve efficiency, sustainability, and patient care. It outlines the potential applications of AI across different levels—patients, healthcare providers, and intermediaries—highlighting tools like electronic health records, cost analysis algorithms, and AI-driven decision support systems. The paper also discusses the current structure of the UHI system and identifies key requirements for successful AI adoption in Egypt's evolving healthcare landscape.[71]

- **Agriculture:** Implementing AI technologies for precision farming, crop monitoring, and optimizing yields.

  o As part of Egypt's digital transformation in agriculture, the Ministry of Communications and Information Technology and the Ministry of Agriculture and Land Reclamation have jointly developed Hudhud, an AI-powered Arabic mobile application designed to support farmers. The app provides tailored digital guidance on crop management, pest identification, and treatment by allowing farmers to upload photos of affected crops. Using artificial intelligence, Hudhud analyzes the images and delivers accurate, timely recommendations. It aims to modernize agricultural practices, improve productivity, and enhance communication between farmers and experts as part of Egypt's shift toward smart and sustainable agriculture.[72]

[70] *OECD.AI (2025), data from OpenAlex, last updated 2025-03-31, accessed on 2025-04-19. Available at: https://oecd.ai*
[71] *https://journals.sagepub.com/doi/full/10.1177/09720634231215139*
[72] *https://mcit.gov.eg/en/Media_Center/Press_Room/Press_Releases/64824*

- As part of academic efforts to advance Egypt's agricultural sector through digital innovation, the study "Precision Agriculture Applicability in Egypt" (2023) explores the use of emerging technologies like AI, IoT, sensors, robotics, and remote sensing in precision agriculture (PA). The research assesses the readiness and challenges of applying PA in Egypt using surveys and expert focus groups. It identifies limited awareness, high costs, lack of strategic planning, and regulatory hurdles as major barriers. The study offers tailored recommendations, including promoting local manufacturing, supporting startups, enhancing financial products, and reduce input waste, and support climate resilience in Egypt's agribusiness landscape.[73]

- **Finance:** Utilizing AI for risk assessment, fraud detection, and automated trading systems.

  - In 2014, a leading Egyptian private bank became an early AI adopter amid national challenges, positioning itself as a digital financial platform. It prioritized data as a core asset, investing in infrastructure and talent, including attracting Egyptian AI experts from abroad to reverse brain drain. The bank introduced roles like data engineers and governance officers, collaborated with global academic institutions, and adopted a data-driven business model. These efforts boosted profitability, operational maturity, and industry leadership in analytics and risk management. Between 2014–2024, it invested around 30$ million in technology and 10$ million in human capital.

  - As an example of academic efforts in Egypt›s finance sector, the Generative AI in Finance Programme reflects a strategic initiative to build digital capacity through applied learning. Led by the Digital Academy of FinTech Egypt in collaboration with the Egyptian Banking Institute (EBI) and powered by the Centre for Finance, Technology and Entrepreneurship (CFTE), the programme targets professionals in banking and finance to explore the practical use of Generative AI. Over three months, participants engage in expert-led sessions, hands-on projects, and case studies to understand AI applications, regulatory frameworks, and innovation trends—bridging global expertise with national capacity-building in financial technology.[74]

  - As part of Egypt's growing interest in digital upskilling, the Generative AI in Finance Programme is a -3month initiative designed to train financial sector professionals in applying Generative AI tools to enhance financial services. Offered through the Digital Academy by FinTech Egypt and powered by the Centre for Finance, Technology and Entrepreneurship (CFTE), the programme is operated by the Egyptian Banking Institute (EBI). Stakeholders involved in the programme include FinTech Egypt under the Central Bank of Egypt, CFTE as the content partner, EBI as the implementing body, international experts and institutions contributing to delivery, and professionals from Egypt's financial sector as participants.[75]

[73] *chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://journals.ekb.eg/article_281055_ddac989d8c3dfabf5f2b9fcd65d35f16.pdf*
[74] *https://www.researchgate.net/publication/388155176_The_Impact_of_Artificial_Intelligence_Applications_on_Financial_Services_quality_and_Financial_Performance_Evidence_from_the_Egyptian_Bank_Sector*
[75] *https://ebi.gov.eg/generative-ai-in-finance/*

- **Education:** Creating personalized learning experiences through AI-driven platforms and tools.

  - In March 2025, The Egyptian Ministry of Education, in partnership with Microsoft Egypt, launched a joint initiative to enhance community capabilities in artificial intelligence through an "Innovation Hub." This initiative aims to prepare students for the future by integrating AI into curricula, improving teaching quality, and empowering teachers through digital training. It includes interactive AI applications, personalized learning tools, and platforms like "Ask Fahim," Egypt's first AI virtual assistant for students. The partnership also supports 23 million students and 1.5 million teachers through digital platforms and has expanded collaboration with over 50 companies to enhance digital education. Stakeholders include the Ministry of Education, Microsoft Egypt, teachers, students, and educational technology partners.[76]
  - An example of academic research in Egypt on education and artificial intelligence is the study "The Potential of Artificial Intelligence to Develop the Education System in Egypt" published as part of Egypt's growing academic interest in AI, the study explores how educational technology companies are applying AI tools such as personalized learning systems and adaptive assessments to enhance teaching and learning. It also identifies untapped technologies like facial recognition and natural language processing that could further transform Egypt's education system.[77]

- **Natural Language Processing:** Advancing technologies for Arabic language processing and translation.

  - An academic journal article from Egypt on Natural Language Processing (NLP) is a paper from Mansoura University, titled "Applications of Natural Language Processing in Healthcare Systems.", this paper explores how NLP technologies—such as clinical decision support systems, speech-to-text for electronic health records, medical chatbots, and intelligent robots—can transform healthcare delivery[78]
  - Another example of research on Natural Language Processing (NLP) in Egypt is the article titled «Arabic Document Classification Using Natural Language Processing and Machine Learning Techniques». The study focuses on developing a model for classifying Arabic documents by combining NLP techniques with machine learning algorithms such as Naïve Bayes and Support Vector Machines.[79]

- **Computer Vision:** Innovating image recognition and analysis applications across various industries.

  - Research in computer vision from Egypt is the article titled «Development of Computer Vision Algorithms for Measurement and Inspection of Spur Gears», published in the Mansoura Engineering Journal. Conducted by E. Gadelmawla from

[76] *https://moe.gov.eg/en/what-s-on/news/18-mars/*
[77] *chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://ejcj.journals.ekb.eg article_336098_463e5ed3a8f744672ba5695bd868d9ca.pdf*
[78] *chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://journals.ekb.eg/article_245582_75196bdd2a81e92397ac1fccdf5ed3fe.pdf*
[79] *chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.jait.us/uploadfile/2023/JAIT-V14N6-1331.pdf*

the Faculty of Engineering at Mansoura University, the study presents a system that applies computer vision techniques to automatically measure and inspect spur gears, a critical component in mechanical systems. The proposed algorithms aim to replace traditional, manual inspection methods with a more efficient, accurate, and automated approach using image processing and analysis tools. This research highlights the role of computer vision in advancing industrial quality control within the Egyptian engineering academic context.[80]

- **Smart Cities:** Enhancing urban planning and management through AI-driven data analysis and decision-making.

  o Research on smart cities from Egypt, the article titled «The Role of Smart Cities in Enhancing Urban Resilience: A Case Study of New Alamein City» explores how smart technologies contribute to strengthening urban resilience in the face of climate change, population growth, and infrastructure stress. Published in the Journal of Urban Research by academics from Cairo University, the paper examines New Alamein as a model city, assessing its integration of digital systems, sustainable urban planning, and resilient infrastructure. It emphasizes how smart city strategies—such as data-driven governance, ICT integration, and sustainable mobility—can improve urban adaptability and sustainability, offering policy recommendations for replicating such models across Egypt.[81]

  o The journal article titled "Artificial Intelligence and Its Role in Management of Main Systems of Smart Cities", explores how AI technologies contribute to the effective management of smart cities. The authors highlight that AI enables real-time data collection and analysis, improving systems such as governance, healthcare, environment, energy, industry, economy, transportation, and infrastructure. Using the S.W.O.T. framework, the paper identifies strengths like enhanced decision-making and efficiency, as well as weaknesses including data limitations and privacy risks. The findings emphasize AI's potential to boost sustainability, safety, and service delivery in urban settings, while also noting economic and regulatory challenges that must be addressed to fully integrate AI into smart city systems.[82]

In addition, experts are applying AI to address a wide range of challenges, including:

- Enhancing the quality of education
- Improving healthcare delivery
- Boosting agricultural productivity
- Supporting sustainability through an Internet of Things
- Protecting the environment
- Increasing economic competitiveness

[80] *chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://mej.researchcommons.org/cgi/viewcontent.cgi?article=2248&context=home*
[81] *chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://journals.ekb.eg/article_399459_5cd3ad71427608c5295501d141f8d02b.pdf*
[82] *chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://journals.ekb.eg/article_399459_5cd3ad71427608c5295501d141f8d02b.pdf*

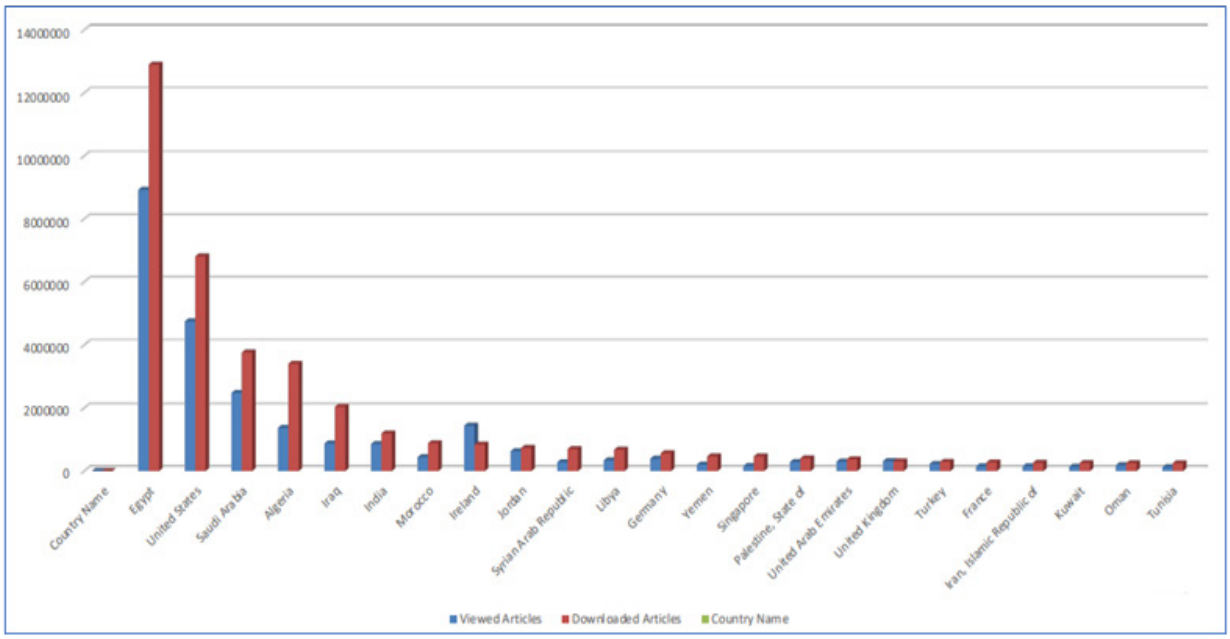
Egypt hosts a growing number of AI R&D centers, positioning it as a regional leader in AI investment. Furthermore, the government is investing heavily in AI education, training and research to further strengthen national capacity.

Egypt›s research output has shown significant improvement in recent years. This growth is evident in the increasing number of publications, stronger collaboration with international research communities, and a growing influence across various scientific fields. Enhanced funding and institutional support have played a key role in driving this positive trend.

The Egyptian Knowledge Bank (EKB) is a national initiative designed to provide all Egyptians with access to a diverse array of knowledge resources. It offers a wide range of digital content, including books, research papers, journals, and educational materials. Serving students, researchers, educators, and the general public, the EKB supports educational initiatives by supplying resources that align with the national curriculum and higher education requirements. By making knowledge readily available to all segments of society, the EKB aims to cultivate a culture of research and innovation. This initiative represents a significant improvement in enhancing Egypt›s educational landscape and promoting a knowledge-based society. It has 31 Publishers, 120 Databases, 2.3 million Visitors/Month, and (Peak) Zero Security Incident. The EKB is increasingly integrating AI to enhance its services and improve user experience.

The EKB is foundational in the development and deployment of the National LMS in Egypt. The EKB has provided several valuable services and solutions to enhance the quality and accessibility of digital learning for millions of students and educators. As shown in Fig. 8, Egypt shows a significantly higher number of viewed and downloaded articles compared to other countries, indicating a strong engagement with the content available.

FIG 8 **Egypt has a higher number of viewed and downloaded articles compared to other countries**



Sources: Global Open Access & Contributions National Publishing Platform Top 20 Global Access - 2023

AI Research Centers

Egypt is home to several prominent AI centers focused on research, development, and innovation. These centers play a crucial role in advancing AI research and applications in Egypt, fostering collaboration between academia, government, and industry. Here are some notable ones:

1. **Nile University AI Center**
   - o Focuses on research and development in AI technologies and applications.

2. **The American University in Cairo (AUC) AI Lab**
   - o Engages in AI research and educational initiatives in collaboration with industry partners.
3. **Cairo University AI Research Center**
   - o Conducts research on various AI topics, promoting academic and industry collaboration.

4. **Information Technology Institute (ITI)**
   - Offers AI training programs and workshops to enhance skills in the tech workforce.

5. **The Applied Innovation Center (AIC)**

   Focuses on bridging the gap between research and practical application. AIC plays a vital role in promoting a culture of innovation and supporting economic development through technology transfer and applied research.

Ethical AI research

Ethical AI research: The growth of research on AI ethics in Egypt is a positive development for the country. AI ethics is essential for ensuring that AI is used to benefit humanity and not to harm it. Egypt is well-positioned to play a leading role in the global discussion on AI ethics and in the development of ethical AI systems.

The Egyptian government›s commitment to training educators/professors to teach about AI/technology ethics is a positive development. It indicates that Egypt is taking AI ethics seriously and is committed to developing AI in a responsible and ethical manner.

Here are some specific examples of the training programs and resources that the Egyptian government has developed to support the training of educators/professors to teach about AI/technology ethics:

- The National Council for Artificial Intelligence (NCIA) has developed a number of AI ethics training programs for faculty members. These programs cover topics such as the ethical implications of AI, ethical guidelines for the development and use of AI, and case studies of AI ethics issues.

- The Egyptian Institute of Informatics and Systems Engineering (EINSI) has developed a number of AI ethics textbooks and other resources for educators. These resources cover topics such as the history of AI ethics, the different ethical theories that can be applied to AI, and practical guidance on how to teach AI ethics to students.

- The Ministry of Higher Education and Scientific Research has also developed a number of resources for educators on how to teach AI ethics. These resources include a guide for developing AI ethics courses, a collection of case studies, and a list of recommended AI ethics textbooks.

Education

Education is a key pillar of human capital, and investment in better, more inclusive education is a crucial prerequisite for a better future. Egypt has the largest overall education system in the MENA region, with 27.6 million students in pre-tertiary education. The public education system in Egypt consists of three levels: basic education, secondary education and tertiary education. Egypt's 2014 Constitution states that education is compulsory until the completion of secondary school or its equivalent[83].

The Egyptian education system is highly centralized and consists of three main stages:

1. **Basic Education:**
   This includes two stages: The Primary Stage and the Preparatory Stage.
2. **Secondary Education**
3. **Tertiary Education**

The curriculum for tertiary education in Egypt is developed by the Ministry of Education and includes both core subjects and optional courses that vary by the type of institution. In recent years, efforts have been made to expand the integration of STEM (Science, Technology, Engineering, and Mathematics) education to reflect global trends and prepare students for emerging demands in the workforce.

Higher education:
After completing secondary school, students can enroll in universities, institutes, or technical colleges. Egypt offers a variety of public and private universities with diverse programs.

	The country is home to 92 prominent AI institutes, including
27	Faculties in governmental universities
20	Faculties in private universities
20	Faculties in national universities
10	Faculties in international universities
15	High institute

[83] . *European Training Foundation (ETF), 2020*

In Egypt, several universities offer dedicated faculties or programs in AI. Here are some notable examples:

Name of university		Type	AI-Related Activities
1	Cairo University	Governmental	Includes AI courses and research within its Faculty of Computer and Artificial Intelligence
2	Ain Shams University	Governmental	Faculty of Computer and Information Sciences, partnering with the University of East London, implemented a Bachelor of Science dual degree program in Artificial Intelligence.
3	Arab Academy for Science, Technology and Maritime Transport	Regional	The College of Artificial Intelligence, founded in September 2019, provides programs in intelligent systems, data science and robotics. This is in addition to the College of Computing and Information Technology which offers AI programs as well.
4	The American University in Cairo (AUC)	Private	Offers programs in AI within its School of Sciences and Engineering.
5	Helwan University	Governmental	Offers an AI program in its Faculty of Computers and Artificial Intelligence.
6	University of Hertfordshire	International	Computer Science (Artificial Intelligence) program offered in the School of Engineering and Science
7	Egypt University of Informatics	National	The Faculty of Computing and Information Sciences offers many AI courses in its programs
8	Nile University	National	The School of Information Technology and Computer Science offers a dedicated Artificial Intelligence program.

Through an efficient, sustainable and flexible institutional framework, Egypt seeks to have a non-discriminatory, high-quality education and training system available to all[84]. The country prioritizes educational development at whether primary, secondary, or higher levels. To achieve this, Egypt is planning to allocate higher budgets for education to support development goals.

AI is an emerging technology that is transforming various aspects of society, including education. AI's fast growth is significantly influencing education. The scope of AI in education is broad and includes:

- Personalized learning platforms that adapt to individual students› learning paths
- Interactive educational materials that incorporate virtual reality to create interactive simulations
- AI-powered virtual learning assistants (e.g., chatbots)
- Tools that help students and their parents to identify their strengths and weaknesses and to improve their performance.

[84] *Sustainable Development Strategy: Egypt Vision 2030. Ministry of Planning and Economic Development.* https://mped.gov.eg/Files/Egypt_Vision_2030_EnglishDigitalUse.pdf

AI is being used to develop new educational tools and resources, such as interactive simulations and virtual reality experiences. Additionally, it could aid in automating tasks such as grading papers and providing feedback to students and teachers. This would allow teachers more time to focus on more important tasks, such as lesson planning and student interaction.

Education strategy:

Egypt has the largest pre-university education system in the Middle East and North Africa region, with over 25 million students. More than 50% of students are in primary education, with another 23% in preparatory education, reflecting a nearly universal net enrollment rate.

The Egyptian government is committed to education as a constitutional right, by ensuring that compulsory basic education is free, and spending no less than 4% of the GDP on pre-university education.

As part of the broader Egypt Vision 2030, the country has developed a comprehensive education sector plan that outlines a five-year roadmap for systemic reform. The plan sets specific targets, prioritizes strategic goals, and outlines actionable steps to achieve them. The plan seeks to achieve the overall objective of transforming the Egyptian education system to ensure universal access to high-quality education and training, foundational learning and skills acquisition for a sustainable future.

The Strategic Vision 2030 is organized along economic, social and environmental dimensions, which are further divided into ten strategic pillars. Although Education & Training stands as its own pillar, it is implicated in other strategic pillars, especially in the target areas of economic development and social justice. At the core of the Strategic Vision for Education 2030 are the values of universal accessibility, inclusivity, sustainability, flexibility, and efficiency.

Educational infrastructure:

Egypt has made significant investments in educational infrastructure in recent years. The government has built new schools, renovated existing schools, and provided schools with new equipment and resources. The government has also made investments in the training and development of teachers. Teachers are now required to have a university degree, and they are provided with ongoing professional development opportunities.

Here are some of the specific initiatives that the Egyptian government has taken to improve educational infrastructure:

- The government has built 10,000 new schools since 2011.
- The government has renovated 20,000 existing schools.
- The government has provided schools with new equipment and resources, such as computers, smartboards, and science labs.
- The government has trained and developed teachers by requiring them to have a university degree and providing them with ongoing professional development opportunities.
- The government has invested in technology by providing schools with computers and other digital devices.

Despite these improvements, there are still some challenges that need to be addressed. Some schools in rural areas are still in poor condition, and there is a shortage of teachers in some subjects. However, the Egyptian government is committed to improving educational infrastructure and to ensuring that all students have access to a quality education.

Curriculum Content:

Egypt has taken a proactive role in this arena, initiating its NAIS over four years ago. It has contributed to drafting ethics guidelines for AI within various international bodies, including the OECD, UNESCO, and the G20, and is leading efforts within the African Union and Arab League to unify regional ethical recommendations. Egypt's commitment has garnered global recognition, making it the first Arab and African nation to adopt the OECD Principles on Responsible AI, and it is an early adopter of UNESCO's AI ethics standards. However, as these recommendations are largely non-binding and generic, countries must localize them into actionable policies for government, academia, industry, and civil society.

Egypt has launched a comprehensive suite of national initiatives to harness the potential of AI in the education sector:

1. The 'AI for Education' program, which is being implemented by the Egyptian Ministry of Education and Technical Education. This program aims to integrate AI into the school curriculum and to provide students with the skills and knowledge they need to succeed in the AI-driven economy.

2. Digital Egypt Builders Initiative (DEBI) aims to grant outstanding graduates a professional master's degree from top global universities in various fields, including artificial intelligence

3. Digital Egypt Pioneers Initiative (DEPI) targets the training of university students and graduate students from all disciplines in cooperation with international companies.

4. Digital Egypt Cubs Initiative (DECI) targets the training of school students from grades 7 to 11.

5. Digital Egypt Marvels Initiative (DEMI) targets the training of school students from grades 4 to 6. In addition to these government initiatives, there are also a number of private and non-profit organizations that are being developed to deliver AI education programs in Egypt. For example, ITIDA offers a number of AI training programs for students, professionals, and businesses.

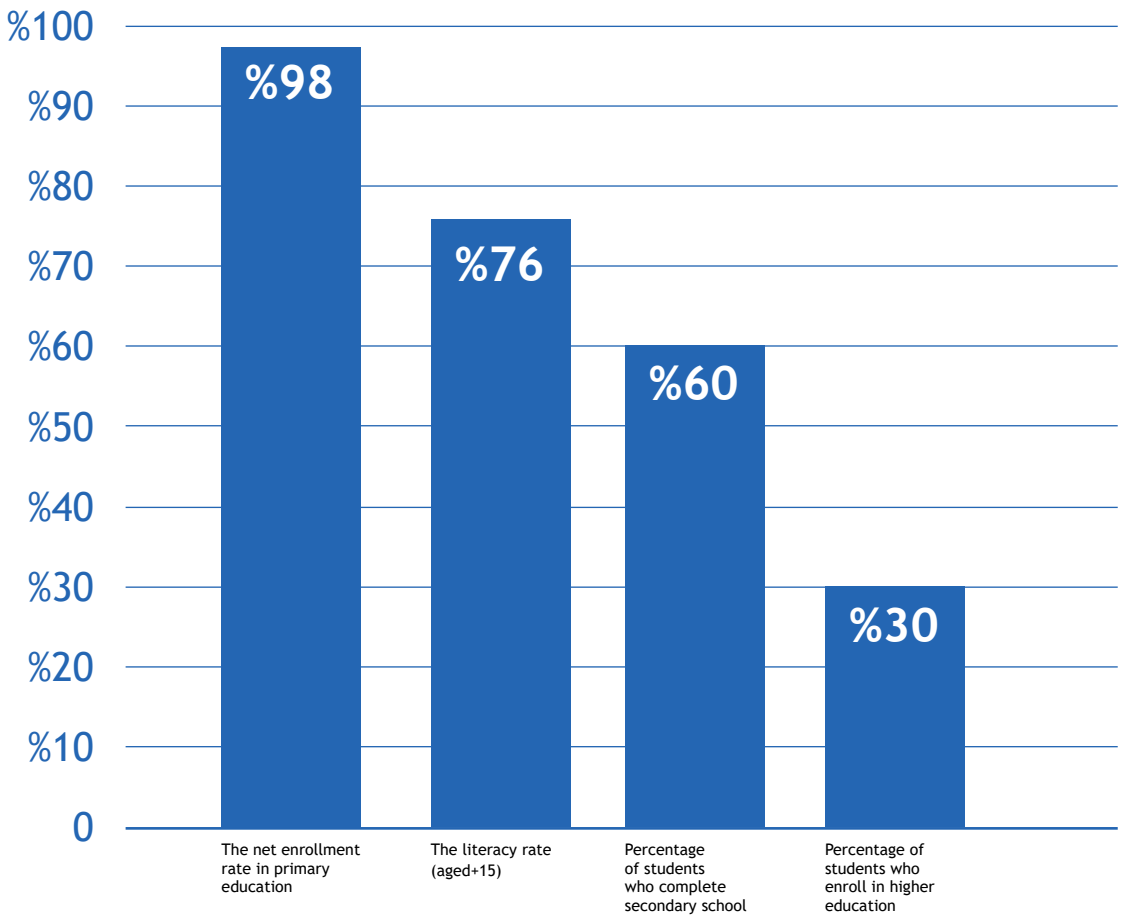
6. Specialized programs offered by the Information Technology Institute (ITI) of MCIT in cooperation with major international companies and universities (such as in partnership with the French EPITA).

7. The AI Capacity Building Initiative is a national program for building capacity in AI within universities and developing professors' skills in that field. Training of Trainers (ToT) courses are organized, and professors are provided with educational material to integrate into curricula and teach students. The aim is to increase AI literacy and raise awareness of AI tools and applications.

8. Specialized programs offered by the National Telecommunication Institute (NTI) in cooperation with major international companies.

9. Creativa, launched by the Ministry of Communications and Information Technology (MCIT), is a national initiative focused on training youth in digital and technology skills to meet job market demands. Located in cities such as Mansoura, Menoufia, Minya, Sohag, Qena, and Aswan, each Creativa hub offers tailored programs in collaboration with institutions like ITI, ITIDA-TIEC, and NTI. The initiative provides practical training for future employment, freelancing, and entrepreneurship, bridging the gap between education and real-world digital opportunities.

Educational attainment: The Egyptian government is making significant progress in improving educational outcomes nationwide.
Current statistics reflect this progress:



Here are some examples of how the public can access AI education in Egypt:

- **Through the 'AI for Education' program:** The Egyptian Ministry of Education and Technical Education is integrating AI into the school curriculum and providing students with the skills and knowledge they need to succeed in an AI-driven economy.
- **Through public libraries and community centers:** The Egyptian government is working to expand access to AI education.
- **Online Courses:** The Egyptian government is creating free online AI courses available to the public through the Information Technology Institute (ITI). These courses aim to support Egyptian youth in enhancing their career opportunities by developing their ICT skills and preparing them for in-demand jobs and emerging technologies that address both current needs and future forecasts.
- **Through private and non-profit organizations:** A number of private and non-profit organizations in Egypt offer free or low-cost AI training courses.

In conclusion, the scientific and educational dimensions of AI are crucial for transforming knowledge creation and application across various fields. Egypt is rapidly emerging as a center for research and innovation in Africa and the Middle East. The country›s education system is evolving to address challenges and align with global standards, particularly in STEM areas, to better prepare students to join the future workforce. By focusing on research, curriculum development, ethics, and collaboration, educational institutions can empower students to become leaders in AI, equipping them to tackle complex challenges and contribute to societal progress.

ECONOMIC DIMENSION

Background

Egypt's AI ecosystem is rapidly expanding and increasingly recognized as a strategic pillar of national development. Under the 2nd edition of its National AI Strategy (NAIS), Egypt aims for AI to contribute 7.7% of the country's GDP by 2030, a strong indicator of its intended economic impact. With over 11 science and technology clusters — the highest in Africa — Egypt has made measurable progress in scientific output, although commercialization through patents remains limited. The country ranks 86th globally in the Global Innovation Index (2024)[85] and hosts more than 480 AI-specialized companies. Initiatives like Egypt Makes Electronics and the Digital Egypt Innovation Hubs are central to expanding tech infrastructure and fostering private-sector innovation[86] . These developments position Egypt as an emerging hub for AI-driven economic transformation across sectors such as finance, healthcare, agriculture, and education.

This dimension explores the size and strength of Egypt's AI ecosystem, particularly in the context of the Fourth Industrial Revolution (4IR). Disruptive technologies play a critical role in developing AI solutions tailored to Egypt's economic priorities and population needs. This section analyzes Egypt's AI market, including its scope, characteristics, and sectoral diffusion across the public and private economy. It also highlights successful adoption cases to illustrate the growing role of AI in Egypt's development path.

The World Bank's GovTech indicator provides a lens to evaluate Egypt's digital transformation, specifically how technology is used to enhance public service delivery, transparency, and citizen engagement. Egypt's overall score is 0.75, placing it in Group A — the highest-performing tier — and above both the regional and global averages. Within this framework, the Digital Skills pillar assesses how well citizens and government employees are equipped to use digital technologies, including the availability of training and digital literacy in education [87]. It is worth noting that Egypt moved up on the GovTech Maturity Index (GTMI) 2022[88] becoming among the countries of group A which is the highest category in the index, up from group B in 2020 and C in 2018. Egypt's strong score signals solid progress in equipping its workforce, though challenges remain in extending foundational digital skills to all societal segments.

Egypt's commitment to digital skill-building is reflected in initiatives like the «Building the Digital Citizen» program, launched by MCIT in 2018. The program, mandatory for public sector employees, aims to raise digital competency across the government.

[85] *World Intellectual Property Organization (WIPO). (2024). Global Innovation Index 2024: Unlocking the Promise of Social Entrepreneurship (17th Ed.). Geneva: WIPO. https://www.wipo.int/global_innovation_index*
[86] *Ministry of Communications and Information Technology (MCIT). (2024). National Artificial Intelligence Strategy 2025-2028 (2nd Edition). https://mcit.gov.eg*
[87] *World Bank. (2021). GovTech: Government Technology Indicators. https://www.worldbank.org/en/topic/governance/brief/govtech*
[88] *As of May 2025, the most recent available data on Egypt's performance in the GovTech Maturity Index (GTMI) is from the 2022 update.*

Further, the UNCTAD Frontier Technologies Readiness Index (2025) ranks Egypt 85th out of 170 countries, with a score of 0.49, just below the global average. This index measures countries' capacity to adopt cutting-edge technologies like AI, robotics, and biotechnology. Egypt ranks above average in the Skills sub-index, where it holds the 92nd position out of[89] 170— indicating that the country is making steady progress in human capital development essential for frontier technology adoption.

Labor Market

The Egyptian labor market in the Age of AI is primarily shaped by the supply and demand of advanced and highly specialized digital skill sets. While the demand for these skills spans both the public and private sectors, it is particularly driven by startups, universities, and multinational companies, which attract much of the available digital talent.

These high-level, demand-driven digital skills are essential for increasing productivity and expanding job opportunities, especially in data-centric and innovation-intensive industries. However, despite the growing importance of STEM education to build a future-ready workforce, Egypt faces persistent challenges: low student enrollment and completion rates in tertiary education[90] continue to hinder the development of advanced digital skills.

Digital skills broadly encompass both foundational and advanced competencies required to operate effectively in a digital society. A digitally literate and technologically adept workforce is crucial for technology adoption and innovation. These skills are foundational to building a resilient digital economy, enabling individuals to engage meaningfully with digital platforms, tools, and services.

Digital competencies are typically divided into four categories based on proficiency levels:

- Basic
- Intermediate
- Advanced
- Highly specialized

[89] *United Nations Conference on Trade and Development. (2025). Frontier technologies readiness index 2025. https://unctad.org/webflyer/frontier-technologies-readiness-index*
[90] *Cazzaniga, M., Jaumotte, M. F., Li, L., Melina, M. G., Panton, A. J., Pizzinelli, C., ... & Tavares, M. M. M. (2024). Gen-AI: Artificial intelligence and the future of work. International Monetary Fund.*

These levels reflect the cognitive challenge, task complexity, and independence needed to perform various digital tasks[91] Notably, AI skills are positioned at advanced and highly specialized levels, requiring a deep understanding of algorithms, machine learning models, data science, and domain-specific applications[92].

The demand for digital skills in Egypt is growing rapidly due to the accelerating integration of AI and digital technologies across multiple sectors. Egypt's global competitiveness increasingly depends on its services sector's ability to apply intermediate and advanced digital skills, such as software operation, data handling, and AI deployment.

Key drivers for rising digital skills demand include:

- Automation of manufacturing processes
- Expansion of AI-driven tasks and smart products
- Integration of Internet of Things (IoT) in agriculture and healthcare
- Emergence of smart cities anda 3D ecosystems[93]
- Digitalization of design, prototyping, and logistics

Sectors forecasted to benefit significantly from AI by 2030 include trade, food and beverage, hospitality, transport, media, fintech, healthtech, and edutech. Public and private initiatives like the Egypt Makes Electronics program support these developments by creating tech parks and fostering innovation.

According to the Global Innovation Index 2024, Egypt has established 11 science and technology (S&T) clusters, the highest number in Africa. However, these clusters are stronger in scientific output than in international patenting, indicating room for commercialization improvements. Egypt ranks 86th globally, 11th among lower-middle-income countries, and 15th in the MENA region, which reflects a performance aligned with its development level[94] .

[91]. *Carretero, M., & Gartner, E. (2024). Artificial Intelligence and historical thinking: a dialogic exploration of ChatGPT/Inteligencia Artificial y pensamiento histórico: una exploración dialógica del ChatGPT. Studies in Psychology, 45(1), 80-102.*
[92]. *World Bank Group. The Arab Republic of Egypt Digital Economy Country Assessment. Washington, DC: World Bank. 2020.p.58.*
[93]. *World Bank Group. The Arab Republic of Egypt Digital Economy Country Assessment. Washington, DC: World Bank. 2020.p.58*
[94] *World Intellectual Property Organization (WIPO) (2024). Global Innovation Index 2024, https://www.wipo.int/edocs/gii-ranking/2024/eg.pdf*

FIG 9 **Top Science and Technology (S&T) Clusters in Africa Source: WIPO (2024), Global Innovation Index, p.81**

Economy name	Cluster count	Clusters names
Egypt	11	Cairo, Alexandria, Mansoura, Zagazig, Banha-Shibin El Kom, Asyut, Tanta, Beni Suef, Minya, Kafr El-Shaikh, Ismailia
South Africa	8	Johannesburg, Cape Town, Durban, Bloemfontein, Pietermaritzburg, Potchefstroom, Grahamstown, Port Elizabeth
Morocco	5	Rabat, Casablanca, Marrakesh, Fès, Oujda
Nigeria	4	Ibadan, Nsukka, Lagos, Abuja
Tunisia	4	Tunis, Sfax, Monastir, Sousse
Ethiopia	2	Addis Ababa, Gondar
Ghana	2	Accra, Kumasi
Algeria	1	Algiers
Benin	1	Cotonou
Burkina Faso	1	Ouagadougou
Cameroon	1	Yaoundé
Congo	1	Kinshasa–Brazzaville
Côte d'Ivoire	1	Abidjan
Democratic Republic of the Congo	1	Kinshasa–Brazzaville
Kenya	1	Nairobi

Source: World Intellectual Property Organization (WIPO) (2024). Global Innovation Index 2024: Unlocking the Promise of Social Entrepreneurship 17th Edition. Geneva: WIPO,p.81

With its strategic location, competitive costs, and policy focus, Egypt aims to become a regional hub for electronics manufacturing and ICT exports. This ambition is projected to fuel further demand for digitally skilled workers[95].

AI is also transforming the private sector. Companies increasingly use chatbots, data analytics, and automation tools to streamline operations and enhance customer service. These shifts generate downstream employment and increase demand for high-level technical roles[96].

Egypt Vision 2030, updated in 2024, prioritizes digital transformation, innovation, and technology adoption. Specific ICT targets include:

- Increasing fixed broadband penetration to 11% by 2025 and 14% by 2030
- Increasing mobile broadband penetration to 65% by 2025 and 79% by 2030

[95]. *Ibid.*,
[96]. *Statista https://www.statista.com/outlook/tmo/artificial-intelligence/generative-ai/egypt (accessed in December 2024)*

The strategy also promotes digital inclusion, gender equity, Public–Private Partnerships, and the integration of AI into national development efforts.

The 2nd Edition of NAIS (2025–2028)[97] outlines macro and micro goals such as:

- Contributing 7.7% of GDP through AI by 2030
- Increasing AI access for 36% of the population
- Doubling AI professionals to 30,000
- Supporting +250 AI companies
- Reaching 6,000 AI publications annually

These developments indicate Egypt's strong intent to align its labor market and economy with global AI trends, supported by local capacity-building programs and international cooperation.

The Supply of Labor in the Age of AI in Egypt

This section explores the status of Egypt's labor supply, especially pre- and post-pandemic. It highlights the government's determined efforts to equip youth with digital skills and harness AI's disruptive power across sectors.

AI, as a transformative technology of the 4IR, is redefining the global and local labor market. Yet, Egyptian graduates often lack the skills to meet these new demands due to persistent weaknesses in technical and higher education systems, as well as declining scientific research standards. While initiatives such as the Egypt University of Informatics, specialized degree programs, and lifelong learning opportunities exist, more progress is needed to raise Egypt's digital skill levels to international standards. A fundamental obstacle is Egypt's relatively low levels of basic literacy and numeracy. These are essential for acquiring even basic digital competencies. According to the QS World Future Skills Index 2024, Egypt ranks 46th globally with an overall score of 60.6. The country demonstrates strong performance in Academic Readiness (76.9) and Future of Work (75.6), reflecting significant investments in higher education and digital infrastructure. However, Egypt faces challenges in Skills Fit and Economic Transformation, indicating a need for better alignment between educational outcomes and labor market demands, as well as enhanced support for innovation and entrepreneurship.[99] The Coursera Global Skills Report 2024 highlights Egypt's commitment to advancing education and skill development, particularly through mobile learning initiatives. While specific rankings for Egypt are not detailed in the report, the emphasis on digital and technological skills like AI, data science, and cloud computing underscores the areas where Egypt is focusing its educational efforts. These initiatives aim to bridge the digital skills gap and prepare the workforce for the evolving demands of the global job market.[100]

[97] *MCIT, AI Strategy, https://mcit.gov.eg/en/Artificial_Intelligence (accessed December 2024 and March 2025)*
[99] *https://www.ecofinagency.com/public-management/2101-46346-africa-s-best-prepared-countries-for-the-global-job-market*
[100] *https://egyptinnovate.com/en/articles/coursera-insights-skills-and-learning-evolution-egypt*

According to the Global Talent Competitiveness Index (GTCI) 2024[101], Egypt improved its rank from 95th to 88th out of 134 countries—especially in vocational and technical skills among lower-middle-income countries. However, it still performs poorly in the "Enable" and "Global Knowledge Skills" pillars. Brain drain is also a major issue: the 2021 LinkedIn–World Bank Report ranked Egypt fifth in AI skills migration[102]. For example, despite the Central Bank of Egypt (CBE) investing 5–4$ million in training cybersecurity engineers annually, many of them leave for higher-paying jobs abroad.

In 2022, only 7.9% of private-sector firms offered formal training. Approximately 29% of youth aged 15–24 were not in education, employment, or training (NEET). Technicians and associate professionals made up just 7% of the workforce. Egypt ranks 89th out of 134 countries for skill mismatch and 117th out of 119 in terms of education system alignment with labor market needs[103]. However, according to a World Bank Report, the extent of staff training in Egypt is rated at 3.9 out of 7, with a score of 48 out of 100, placing it at 75 out of 141 countries worldwide. This low level of staff training restricts productivity and the adoption of digital tools.[104].

Furthermore, digital talent constitutes only 1.9% of full-time employees, and women are underrepresented. In Egypt, men are more prone to participate in entrepreneurship compared to women, with rates of 12.3% for men versus 9.2% for women[105]. Of 21 AI startups in 2021, only two were female-founded. The Global Entrepreneurship Monitor 2021/2022 report found 67.7% of early-stage Egyptian entrepreneurs use digital tools, but many still face challenges attracting technical co-founders or skilled developers[106] [107]. The founders of these digital enterprises often lack the necessary digital and technical skills to transform their concepts into practical products. As a result, they tend to seek out a co-founder with the needed expertise or, more commonly, rely on hiring qualified personnel for their teams. The challenge of finding and keeping programming talent presents a substantial operational risk for startups.

Egypt has emerged as a leader in AI-driven entrepreneurship within the MENA region, ranking 2nd in the MENA Startup Ecosystem in Knowledge, according to Startup Genome. With nine innovation hubs across the country, Egypt's startup ecosystem attracted 190$ million in funding in 2020, increasing to 517$ million in 2022. The Ministry of Planning and Economic Development (MoPEDIC) has responded by forming a dedicated startup committee, which uses AI to empower emerging businesses—particularly in rural areas—by offering localized tech-based solutions. These efforts aim to foster inclusive innovation and retain talent domestically.

To address these gaps, the government of Egypt has launched several strategic initiatives under the 2nd edition of NAIS. These include:

[101] *INSEAD (2023): The Global Talent Competitiveness Index 2023: What a Difference Ten Years Make What to Expect for the Next Decade Fontainebleau, France.*
[102] *OECD (2024), OECD Artificial Intelligence Review of Egypt, OECD Publishing, Paris, https://doi.org/10.1787/2a282726-en.*
[103] *INSEAD (2023): The Global Talent Competitiveness Index 2023: What a Difference Ten Years Make What to Expect for the Next Decade Fontainebleau, France.*
[104] *World Bank Enterprise Surveys 2020b, http://www.enterprisesurveys.org*
[105] *OECD, 2024), OECD Artificial Intelligence Review of Egypt, OECD Publishing, Paris, p.44.*
[106] *World Bank Group. 2020a. The Arab Republic of Egypt Digital Economy Country Assessment. Washington, DC: World Bank.*
[107] *OECD (2024), OECD Artificial Intelligence Review of Egypt, OECD Publishing, Paris, https://doi.org/10.1787/2a282726-en.*

1. **National Arabic Large Language Models (LLM):** to enhance local language AI capabilities across sectors.
2. **R&D Resource Initiative:** to attract academic and industry experts.
3. **AI Patent System:** to incentivize innovation and protect intellectual property.

Between 2022 and 2023, more than 400,000 individuals were trained in digital capacities, supported by over EGP 1.7 billion in investments. Key figures include:

- 140,000 graduates from various programs
- 38,000 in Digital Marketing
- 20,000 in Data Architecture and DevOps
- 15,000 in Web Development
- 3,400 in Autonomous Systems, Embedded Software
- 2,800 in Cloud and Machine Learning
- 5,443 trained in 40+ specialized tracks via 300 partners

The Digital Egypt Builders Initiative also graduated 624 master's-level students (56% women), while the Digital Egypt Pioneers trained 90,000 graduates. The Qodwa-Tech program supported women in using AI for product development and marketing. Notably, 95% of female participants reported using AI in design, and 85% reported improved living conditions.

Other initiatives include:

- AI Innovators Hub

  The AI Innovators Hub is a key component of Egypt's 2nd edition of NSAI to foster a culture of research and entrepreneurship in AI. It functions as a collaborative platform that connects researchers, developers, and startups with access to advanced resources such as datasets, hardware, and funding. The Hub supports the entire innovation lifecycle—helping individuals and teams transform ideas into practical, scalable AI products. It also creates a pipeline for nurturing early-stage AI talent by integrating academic support with real-world applications. By bridging academia, government, and industry, the Hub plays a pivotal role in strengthening Egypt's domestic innovation ecosystem.

- Professional certifications (e.g., CT-AI)

  The Certified Tester in AI (CT-AI) certification, offered through the Software Engineering Competence Center (SECC), is tailored for professionals seeking to master AI system testing and AI-assisted testing tools. Since 60 ,2024/2025

examinees have earned this certification, which is endorsed by 21 companies and two universities. CT-AI supports Egypt's strategy to standardize AI competencies through internationally aligned frameworks. It caters to a broad demographic—private sector professionals, university students, and freelancers—underscoring its relevance in both education and employment settings. This certification initiative is part of Egypt's broader effort to professionalize its AI workforce and ensure high-quality assurance in AI system deployment.

- Collaboration with ITIDA and Software Engineering Competence Center (SECC)

  ITIDA, through its SECC, has been instrumental in developing Egypt's AI talent base. SECC offers tiered AI courses from beginner to executive level, including cutting-edge topics such as generative AI and AI ethics. Over 17,000 participants have benefited from these programs, which also extend to government officials in ministries like Health. The collaboration has spurred corporate engagement, with 100 companies and 200 individuals enrolled in 2024 alone. These programs reinforce national goals to expand the pool of highly skilled AI professionals and support both the public and private sectors with targeted, demand-driven AI training.

- Public awareness programs

  Egypt's AI strategy includes outreach programs to enhance general awareness and digital literacy. The SECC leads public AI awareness campaigns covering topics like responsible AI use, ethics, and digital transformation. These sessions, attended by around 1,800 participants from both public and private sectors, aim to demystify AI and foster informed adoption across society. The inclusive design ensures participation from a wide range of stakeholders, including startups, freelancers, and civil servants. These efforts are critical for building a broad-based understanding of AI, reducing resistance, and preparing the population for future AI integration.

- International partnerships with UNDP, OECD, and UNESCO

  The Egyptian government has partnered with global organizations like UNESCO, UNDP and OECD, to scale AI capacity and ensure alignment with international standards. For instance, since 2019, collaboration with UNDP alone has led to 28,637 trainees acquiring digital skills in AI, IoT, and cybersecurity. These partnerships enrich Egypt's talent pool with access to international best practices, funding, and expertise. They also support knowledge transfer, particularly in regions or sectors that require foundational digital

transformation. These engagements exemplify Egypt's commitment to becoming a regional leader in responsible and inclusive AI development.

- Regional e-Government pilots in governorates

The Institutional Digital Transformation project in Egypt's governorates is a localized effort to implement AI in public administration. Piloted in Lower Egypt, this initiative creates Digital Transformation Units (DTUs) within governorate offices, training staff and streamlining services. The project has improved Egypt's standing in the UN's E-Government Development Index (EGDI), which now exceeds the global average. The pilot includes AI-enhanced workflow systems and citizen-facing services, serving as a scalable model for all 27 governorates. This decentralization strategy ensures AI's benefits reach rural and urban populations alike, promoting inclusive growth.

- Sector-specific use cases in health (e.g., AI in mammogram screening) and banking (e.g., AI-driven digital transformation)

In healthcare, Egypt's "AI in Mammogram" project—led by the Applied Innovation Center (AIC) and Bahya NGO—uses AI to detect breast cancer in early stages. The system, trained on 7,000 anonymized mammograms, is expected to serve 60,000 patients annually by 2025. Meanwhile, in banking, a major private bank has invested over \40$ million since 2014 in AI-driven digital transformation. It has developed a robust data infrastructure, reversed brain drains by hiring Egyptian experts and introduced roles like data engineers and AI officers. These sector-specific applications show the economic and social returns of strategic AI adoption.

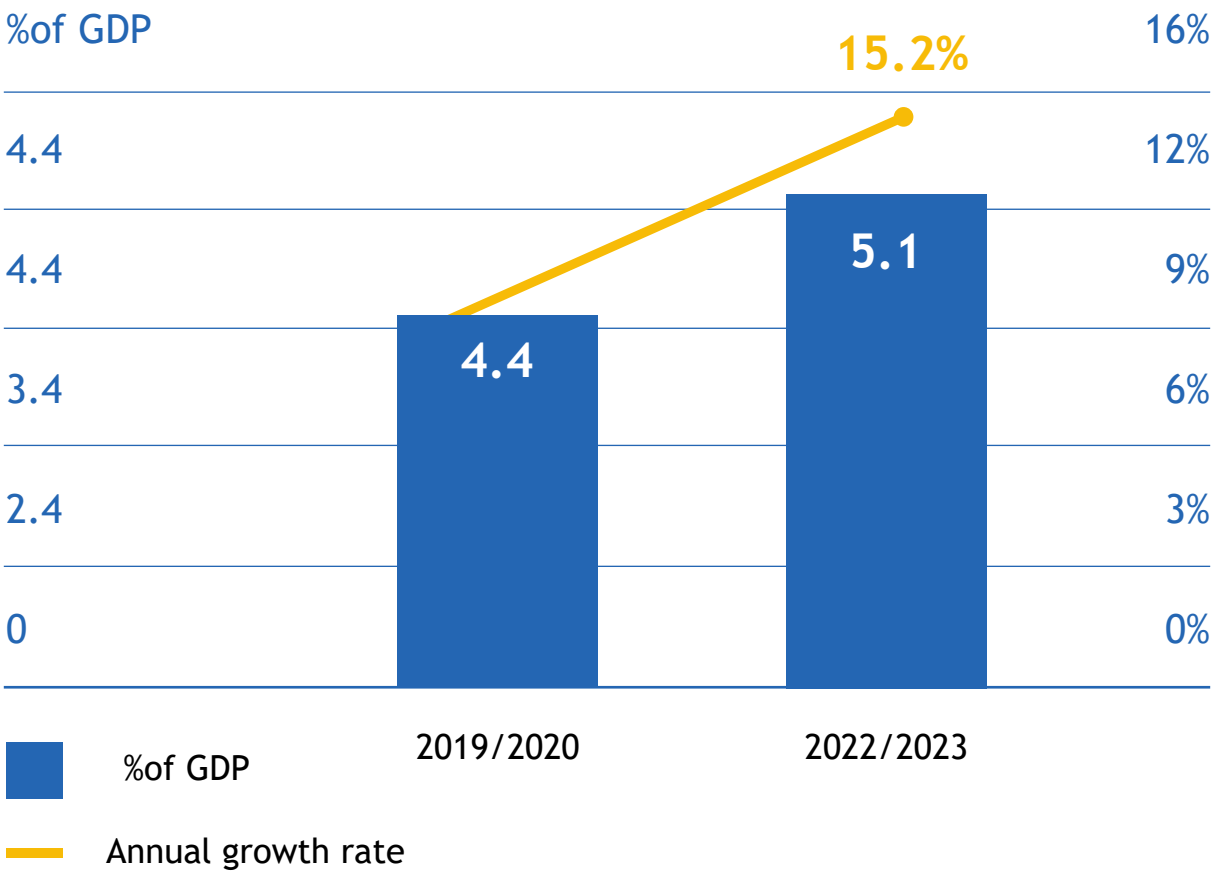
Intermediate Consumption

Currently, there are no reliable national data sources in Egypt that track the intermediate consumption of AI technologies—that is, the use of AI tools, platforms, or services as inputs in production across sectors. This data gap is not unique to Egypt; many countries face similar challenges due to the lack of standardized methods for measuring AI-specific expenditures within national accounts. Although AI applications are increasingly present in areas such as finance, healthcare, and public administration, there is no systematic measurement of their scale or economic value. Developing such indicators will be important for understanding how deeply AI is being integrated into Egypt's economy and for shaping future policy.

Investments and Output

The ICT sector in Egypt grew rapidly, contributing approximately 5.1% of GDP in the fiscal year 2022/2023, with an annual growth rate of 15.2%, compared to 4.4% in 2019/2020[108]. Investments in ICT reached 4.2$ billion during 2022/2023, reflecting a 20% increase over the previous fiscal year. The sector represents about 1.8% of all jobs in Egypt and has been expanding at 5.5% annually, outpacing the national job growth rate of 2.1%. Notably, Egypt's Business Process Outsourcing (BPO) industry employed more than 200,000 professionals in 2021[109]. Additionally, Egypt's engineering and electronic product exports were valued at 5.768$ billion in 2024[110].

FIG 10 **Egypt's ICT sector contributing to GDP International Trade Administration, (2024)**



[108] International Trade Administration, (2024), Digital Economy in Egypt, Washington DC, USA https://www.trade.gov/country-commercial-guides/egypt-digital economy#:~:text=The%20Information%20and%20Communications%20Technology,in%20fiscal%20year%202019%2F2020. (accessed December 2024)
[109] Kamel, S. (2021). The role of digital transformation in development in Egypt. Journal of Internet and e-business Studies, 911090.
[110] Ministry of Investment and Foreign Trade https://www.sis.gov.eg/Story/204226/%245.768B-Egypt's-engineering%2c-electronic-product-exports-in-2024?lang=en-us

According to ITIDA, The ICT sector achieved revenues amounting to EGP 315 billion in the current fiscal year, with a growth rate of about 75%. The ICT sector's contribution to the GDP reached 5.8% in 2023/2024, up from 5% in 2022/2023, and is expected to reach 8% in 2030[111].

To support digital literacy and workforce development, the government trains 500,000 citizens annually in digital skills, targeting ICT and non-ICT graduates, youth, and the general public. Initiatives include the establishment of 19 technical ICT schools and the Egypt University of Informatics, founded in 2021 with partners like Purdue, Minnesota, and Ottawa. Moreover, 23 Digital Egypt Innovation Hubs have been launched nationwide to foster innovation and entrepreneurship[112] [113].

Egypt's offshoring industry has grown significantly, with over 180 global companies now operating in the country, up from 64 in 2021. Egypt hosts more than 200 offshoring centers serving five global regions. The workforce includes over 400,000 ICT professionals and 150,000 offshoring specialists. More than 10,000 ICT companies operate in Egypt, of which 480 are AI-specialized companies. Egypt ranks first in Africa for internet speed and is among the top three MENA startup ecosystems. Between 2010 and 2021, exports of computers and communications rose from 0.1% to 2.9% of service exports. Student enrollment in ICT programs increased from 36,500 to 43,100 (2017-2021), and graduates rose from 128,900 to 210,900[114].

To stimulate AI investment, Egypt is launching an AI Venture Capital Awareness Program and an AI Investment Communication Platform to connect investors, startups, and policymakers. An AI Investment Regulatory Framework is being developed to ensure transparency and compliance, while a Sector Integration initiative simplifies registration and offers tax incentives. The AI Startup Financial Support Program provides funding at various growth stages, and the International AI Investment Promotion strategy seeks to attract global investment. The 2nd Edition of the NAIS targets 150$ million in venture capital funding for over 250 domestic AI companies.

Government Preparedness for AI:

The Government of Egypt is collaborating with multinational companies to enhance AI adoption in public sector ministries. These companies support big data and analytics platforms, provide capacity-building programs, and prepare datasets for future AI models. One company launched Egypt›s first local public cloud service, enabling startups and Small and Medium-sized Enterprises (SMEs) to access AI services affordably in local currency. Others focus on developing Arabic LLMs and providing computing power to support digital transformation.

[111] *ITIDA, https://itida.gov.eg/English/Programs/Industry-Outlook/Pages/default.aspx, Accessed in 27/5/2025.*
[112] *MCIT, https://mcit.gov.eg/ (accessed March 2025)*
[113] *ITU DATA HUB 2024, https://datahub.itu.int/ (accessed December 2024)*
[114] *CAPMAS (2024), Artificial Intelligence Development in Egypt during the period 2010-2022, Cairo, Egypt.*

Mobile Network Operator (MNO):

Private MNOs are heavily investing in AI. One multinational MNO built an in-house AI team and integrated AI tools across departments, investing 2.5$ million over 18 months. It developed a smart network planning system using a Classical Learning Model (CLM) to enhance customer service, efficiency, and energy savings. The operator also began fine-tuning open-source LLMs for Egyptian Arabic applications.

Startups and Ecosystem:

Pure AI startups are still rare due to high development costs, but many startups integrate AI for customer scoring, process optimization, and UX. Emphasis on data ethics is growing to attract international investors. A global innovation platform in partnership with MCIT and ITIDA has connected over 200 Egyptian startups to global capital worth 80$ million. The program supports AI-enabled startups in finance, health, and logistics, and includes bootcamps and regional hackathons.

Two success stories of local startups working with AI who have broken out into the global market are:

- **Synapse Analytics:** Offers products that compete globally in AI-driven financing and lending solutions.
- **Instabug:** Is an AI-powered platform which offers performance monitoring, crash analytics, and user feedback tools, which support over 2.7 billion devices worldwide. It became a global leader in mobile app observability.

These developments reflect Egypt›s strong commitment to building a robust AI and technology ecosystem.

In conclusion, Egypt is making significant strides in AI adoption and ICT sector development, supported by substantial investments in infrastructure, talent development, and innovation ecosystems. The government has trained over 500,000 citizens annually in digital skills, reskilling, and upskilling, targeting ICT graduates, youth, and marginalized populations. Initiatives such as the Digital Egypt Innovation Hubs and specialized AI programs demonstrate a strong commitment to building a competitive and inclusive digital economy. In parallel, private sector and NGO engagement is helping to prepare Egypt's labor force—especially youth—for an AI-driven future. These efforts align with Egypt's 2nd edition of NAIS, aiming to boost GDP, enhance AI R&D, and position Egypt as a regional leader. Despite this progress, addressing challenges such as talent retention, skills mismatch, and sustainable investment remains key to unlocking the full potential of AI for Egypt's economic transformation.

TECHNICAL AND INFRASTRUCTURAL

Background

The technical and infrastructural dimension reflects the idea that without the relevant infrastructure, AI development and the implementation of AI-based solutions cannot be scaled up throughout the country. Therefore, this dimension aims to assess the adequacy of existing ICT and other related technical infrastructure. Among other things, the dimension will assess internet connectivity and access, availability of data centers, cloud computing capabilities, and supercomputers. Given the critical importance of data for AI technologies, this dimension also examines the availability of high-quality data and corresponding practices for ensuring that data is representative.

Infrastructure and Connectivity

Egypt is making significant strides in the adoption of AI and is enhancing its ICT sector through substantial investments in infrastructure, digital skills, and innovation projects. The country has constructed a robust 6,000+ km fiber optic network, which has significantly improved its digital infrastructure. This initiative has led to a 16-fold increase in fixed broadband (FBB) internet speed between 2017-2025, alongside a fourfold increase in broadband subscriptions. Additionally, 1,458 villages have been connected to fiber optic networks in the first phase of this initiative, ensuring increased access to high-speed internet.

As reported by the MCIT, in the period from April to June 2024, mobile subscriptions in Egypt amounted to 110.41 million, which constitutes 94% of the total population.[115] In November 2023, the percentage soared to 96.73% .[116] Subscribers numbered 102.77 million in March 2023,[117] and this figure increased to 103.74 million by November.[118] From April to June 2024, fixed line subscriptions were at 12.84 million, with 10 million in urban areas and 2.84 million in rural areas.[119]

[115] *MCIT, ICT Indicators in Brief June 2024 | Quarterly Issue. P.2.*
https://mcit.gov.eg/Upcont/Documents/Publications_992024000_ICT_Indicators_Quarterly_Bulletin_Q2_2024.pdf
[116] *MCIT, ICT Indicators in Brief December 2023 | Monthly Issue. P.2.*
https://mcit.gov.eg/Upcont/Documents/Publications_1512024000_ICT_Indicators_in_Brief_December_2023_15012024.pdf
[117] *MCIT (2021-2022). Survey of ICT usage in household and individuals. Retrieved from*
https://mcit.gov.eg/Upcont/Documents/Publications_1272023000_ICT_Indicators_Quarterly_Bulletin_Q1_2023.pdf
[118] *MCIT, ICT Indicators in Brief December 2023 | Monthly Issue.P.2*
https://mcit.gov.eg/Upcont/Documents/Publications_1512024000_ICT_Indicators_in_Brief_December_2023_15012024.pdf
[119] *MCIT, CT Indicators in Brief June 2024 | Quarterly Issue. P.2.*
https://mcit.gov.eg/Upcont/Documents/Publications_992024000_ICT_Indicators_Quarterly_Bulletin_Q2_2024.pdf

By the start of 2024, there were 82.01 million internet users in Egypt, with internet penetration at 72.2%.[120] According to the Speedtest Global Index, the speed of fixed broadband in Egypt by November 2024 was 76.67 Mbps, ranking 78th globally,[121] while in October 2023, it was 61.22 Mbps, ranking 83rd globally.[122] Worth noting that Egypt was been ranked 1st in Africa in fixed broadband speed across 2024. Mobile data speed was 24.7 Mbps, ranking 93rd globally. 2024[123] witnessed an increase in the percentage of internet users with 83.02% of the population connecting, compared to 2022 and 2023 where only 72% of the population was connected.[124] In 2024, 99.89% of the population was covered by a 3G mobile network,[125] while 99.62% of the population was covered by a 4G mobile network.[126] Egypt is one of 14 countries in Africa where 5G networks are being tested or widely deployed.[127] Other African countries, including North African countries, still invest in 4G networks.[128] Egypt has achieved remarkable strides in connectivity and is among the leading countries on the continent in this regard.

Digital Divide:

In 2022, it was reported that there is a 6.90% gap between male and female internet users, ranking 50th globally (Economist Impact, 2022). In 2022, there was also a 3% gap between male and female access to mobile phones. Additionally, in a survey conducted between 2021 and 2022, the share of households using the internet in urban areas was 81%, which is a much higher rate than the 68.1% in rural areas. This indicates a 13% difference between rural and urban household internet access (Statista).

Applied Standards

Egypt is actively participating in standardization work whether touching directly or indirectly with AI. It holds several significant leadership roles within the International Telecommunication Union's Telecommunication Standardization Sector (ITU-T), reflecting its active engagement in global ICT standardization efforts including the following:

Chair of Study Group 3 (SG3): Focusing on economic and policy issues, including tariff and accounting principles, and international telecommunication/ICT economic and policy matters. A Senior Expert at Egypt›s National Telecom Regulatory Authority (NTRA), was elected in 2022 as the Chair of Study Group 3, marking the first time an Egyptian and Arab has held this position.

[120] *Data Reportal , Egypt 2024, https://datareportal.com/reports/digital-2024-egypt?rq=egypt*
[121] *Speedtest Global Index. Egypt's Mobile and Broadband Internet Speeds - Speedtest Global Index*
[122] *Speedtest Global Index. https://www.speedtest.net/global-index/egypt#mobile*
[123] *Speedtest Global Index. Egypt's Mobile and Broadband Internet Speeds - Speedtest Global Index*
[124] *International Telecommunication Union (ITU), (2022), The Digital Development Dashboard, Egypt. P2 https://www.itu.int/en/ITU-D/Statistics/Documents/DDD/ddd_EGY.pdf*
[125] *Figures of 2023 were not available during the time of writing this report.*
[126] *Stasista, Digital & Connectivity Indicators - Egypt. https://www.statista.com/outlook/co/digital-connectivity-indicators/egypt#:~:text=The%204G%20network%20coverage%20in,to%20amount%2099.89%25%20in%202024.*
[127] *Diplo Foundation , Status of internet access and connectivity in Africa, https://www.diplomacy.edu/resource/report-stronger-digital-voices-from-africa/internet-access-connectivity-africa/*
[128] *Diplo Foundation , Status of internet access and connectivity in Africa, https://www.diplomacy.edu/resource/report-stronger-digital-voices-from-africa/internet-access-connectivity-africa/*

- Vice-Chair of Study Group 12 (SG12): Dealing with performance, Quality of Service (QoS), and Quality of Experience (QoE).
- Vice-Chair of Study Group 13 (SG13): Concentrating on future networks, including aspects of cloud computing, mobile, and next-generation networks.
- Vice-Chair of Study Group 17 (SG17): Addressing security aspects of telecommunication networks and services.
- Vice-Chair of Study Group 20 (SG20): Focusing on the Internet of Things (IoT) and smart cities and communities.
- Vice-Chair of the Standardization Committee for Vocabulary (SCV): Ensuring consistency and clarity in the terminology used across ITU-T Recommendations.
- Rapporteur at the SG5 on the environment climate change and ICTs, Egypt was also vice chair of WP2 of the group involved in studying the environmental impact of ICTs including AI
- Egypt has also recently joined the focus group on The ITU-T Focus Group on AI-Native Networks (FG AI-Native) was established by ITU-T Study Group 13 in July 2024 after WTSA24- aiming at exploring and defining the fundamental changes needed in network architecture to fully harness the potential of AI.
- Egypt actively contributes to the ITU-T Focus Group on Metaverse (FG-MV), which explores the technical requirements and standards necessary for the development of the Metaverse. The Ministry of Communications and Information Technology (MCIT) is a member of this group and participates in its various working groups, including the role of AI in the Metaverse.

Through these roles, Egypt contributes to shaping international ICT policies and standards, particularly in areas such as AI, and related economic regulation, network performance, security, IoT, and emerging technologies like the Metaverse. Through its work on standardization in the ITU, Egypt collaborates with other standardization bodies such as the ISO, IEEE, ETSI and others.

Egypt actively participates in ITU activities related to AI, including the «AI for Good» initiative and focus groups addressing AI-related issues.
The Egyptian AI team members follows up WIPO meetings on AI, data, and intellectual property policy. MCIT

ISO/IEC JTC 1/SC 42 Membership: Egypt is a participating member in the ISO/IEC JTC 1/SC 42 committee, which focuses on the standardization of AI. Egypt is represented by the Egyptian Organization for Standardization and Quality (EOS) in this committee. As a participating member, Egypt actively contributes to the development of international AI standards, including those related to AI governance, trustworthiness, risk management, and ethical considerations.

Computing Capabilities

Egypt currently has 15 data centers, primarily clustered in and around Cairo:

- 12 centers are located within Cairo.
- The remaining centers are in the 6th of October City, El Asher Men Ramadan City, and El Mansoura (Source: Data Center Map).

Key owners and operators include:

- Telecom Egypt
- Egypt for Information Dissemination (EGID)
- ECC Solutions
- Link
- Egypt Network
- Raya
- Life
- GPX
- City Net
- Etisalat

The colocation rate is approximately 0.13 data centers per million population—an area for potential infrastructure expansion. There are also 0.13 colocation data centers per million population[129]

Statistical performance

This section evaluates a country's capacity to collect, publish, and use reliable, disaggregated data related to AI readiness. Currently, no centralized or AI-specific statistical framework exists in Egypt, and publicly available data on AI workforce, investment, or adoption remains limited. This reflects a broader global trend, as many countries are still developing methods to capture AI-specific indicators within national statistics. Improving statistical performance will be essential for enabling evidence-based policymaking and monitoring progress toward inclusive and accountable AI development.

[129] *Idem.*

In conclusion, Egypt has exerted substantial efforts to ensure nationwide connectivity. The country has established a robust fiber optic network, significantly enhancing its digital infrastructure. This initiative has led to a notable increase in fixed broadband internet speeds between 2017 and 2025. Additionally, villages have been connected to fiber optic networks during the first phase of this initiative, expanding access to high-speed internet and helping to bridge the digital divide.

With regard to AI, Egypt will need to deepen international cooperation to secure the specialized infrastructure, technologies, and investments required for the development and deployment of AI applications.

DEVELOPING A NATIONAL MULTISTAKEHOLDER ROADMAP

Overview

To support the development of the RAM report, UNESCO, in collaboration with MCIT, engaged a wide range of stakeholders across Egypt's AI ecosystem. The process included active participation from government institutions, the private sector, civil society, academia, regional and international organizations, and independent experts. As part of this effort, UNESCO and MCIT jointly organized two National Stakeholder Consultations on the Ethics of Artificial Intelligence.

These consultations were complemented by 30 in-depth interviews with experts representing the full spectrum of stakeholders, ensuring that the RAM report reflects diverse perspectives and sectoral insights.

1. National Stakeholder Consultations

To support the development of RAM, UNESCO and MCIT organized two National Stakeholder Consultations on the Ethics of Artificial Intelligence in Egypt. These consultations aimed to gather insights from key actors in the AI ecosystem and ensure inclusive and participatory policymaking.

a) The first consultation, held in February 2025, addressed the five RAM dimensions: legal, social and cultural, science and education, economic, and infrastructure. The consultation brought together 145 participants from various sectors, structured into four thematic working groups aligned with these dimensions:

- **Legal dimension** discussions explored whether Egypt needs a dedicated AI law or can rely on existing frameworks. Experts examined challenges related to data governance, redress mechanisms, and the suitability of current laws.

- **Social and cultural dimension** participants focused on reducing bias in AI systems, promoting cultural diversity through local-language AI tools, and integrating AI in healthcare and agriculture.

- **Education and infrastructure dimension** discussions assessed national policies for integrating AI into the education system, educator training, digital literacy, and improving technical infrastructure for responsible AI.

- **Economic dimension** topics included AI's potential to mitigate unemployment, create new job categories, and the types of digital skills required for workforce readiness in both public and private sectors.

Participants included:

- 83 representatives from government ministries and national agencies (e.g., MCIT, Ministry of Defense, Ministry of Justice, Ministry of Higher Education, Central Bank of Egypt, ITIDA, NTRA)
- 7 representa tives from international and regional organizations, including UNESCO, UNDP, the League of Arab States, and the European Union
- 19 private sector representatives (e.g., Microsoft, Huawei, Orange Egypt, Vezeeta, Affectiva)
- 4 from the banking sector
- 20 from academia
- 7 from civil society and individual experts

b) The second consultation, held in April 2025 and attended by around 70 participants, focused on three interrelated areas: AI for cultural preservation, social inclusion, and environmental sustainability. The consultation aimed to assess Egypt's preparedness for AI governance and generate actionable, locally tailored insights to maximize AI's contributions to equity, innovation, and national development. The event showcased the value of multisectoral engagement in co-developing policies that are not only technologically sound but also ethically aligned with human rights and the Sustainable Development Goals.

- **AI and Culture:** Participants explored how AI technologies can help digitize and safeguard Egypt's vast cultural heritage. The discussions emphasized the need to balance innovation with authenticity, calling for long-term investments in training, inter-agency cooperation, and youth-led projects that make Egypt's cultural history more accessible and inclusive through AI.
- **AI and Social Inclusion:** The consultation highlighted how AI must be developed with intentional fairness to avoid replicating or worsening existing social inequalities. Key themes included:

    - Ensuring that AI tools are designed for gender equity and accessibility,
    - Expanding digital literacy and ethics training across vulnerable and underrepresented groups,
    - Building robust public-private partnerships to democratize access to AI technologies and reduce regional divides.

- **AI and Environmental Sustainability:** In the environmental track, AI was identified as a crucial enabler for advancing climate resilience, natural resource management, and early warning systems. Examples included:

  - Using AI in water management and irrigation forecasting,
  - Satellite-based monitoring of climate and biodiversity data, and
  - Energy efficiency optimization using predictive analytics.

  Challenges such as fragmented datasets, limited institutional capacity, and the absence of long-term environmental records were flagged. Experts called for stronger inter-institutional data sharing, investment in local R&D, and the creation of enabling environments for AI solutions tailored to Egypt's ecological context.

2. Expert Interviews

In addition to the multi-stakeholder consultation meetings, the RAM report was informed by 22 individual interviews with experts representing a wide range of sectors, including government, academia, civil society, the private sector, and independent professionals. These interviews featured leading figures such as:

- Mr. Ahmed El Saeed, Advisor to the Minister of CIT and Head of Sector at the National Telecommunications Regulatory Authority (NTRA), MCIT
- Dr. Ahmed Tantawy, Founding Chairman of the Applied Innovation Center, MCIT
- Ms. Dina Sallam, Head of Data, AI & CVM Analytics, Orange Egypt
- Ms. Ebtehal Basiouny, Head of Government Affairs, Microsoft Egypt
- Dr. Gillan Felfela, Board Member of Trustees, Baheya Foundation
- Dr. Haitham Hamza, Professor and Vice-Dean for Postgraduate Studies and Research at Cairo University, and R&D Manager, SECC-ITIDA
- Dr. Hala Zayed, Member, Egyptian Supreme Council
- Dr. Hoda Baraka, Advisor to the Minister of CIT for Technology Talent Development, MCIT
- Dr. Hoda Dahroug, Advisor to the Minister for Digital Community Development and National Project Director, MCIT
- Dr. Islam Zekry, Group CFO and Executive Board Member, CIB
- Ms. Karima El Hakim, VC Country Director and Co-Director for Africa, Plug & Play Tech Center
- Dr. Maha Abdel Naser, Member of the Egyptian Parliament

- Eng. Medhat Mahmoud, Chief of Digital Transformation, Huawei Northern Africa
- Dr. Mohamed Hegazy, Legal Expert on Technology
- Dr. Moumen El Eshmawy, Deputy Minister Advisor for Institutional Development, MCIT
- Ms. Noha Fathy, Internet Governance Consultant
- Dr. Sherif Hazem, Sub-Governor for Cybersecurity, Central Bank of Egypt
- Ms. Suzaane El-Kbaoui, Advisor to the Minister of CIT for Data Governance
- Judge Taher Abou Elaaid, Judicial Expert
- Dr. Tamer Taha, Advisor to the Minister for Innovation and Entrepreneurship, and Head of Private Sector Engagement at MoPEDIC
- Judge Waleed Amin, Legal Counsel and Supervisor of the Legal and Compliance Sector at ITIDA
- Mr. Yahya El Wathek Bellah, Minister Plenipotentiary and Head of the Egyptian Commercial Service, Ministry of Investment and Foreign Trade (GAFI)

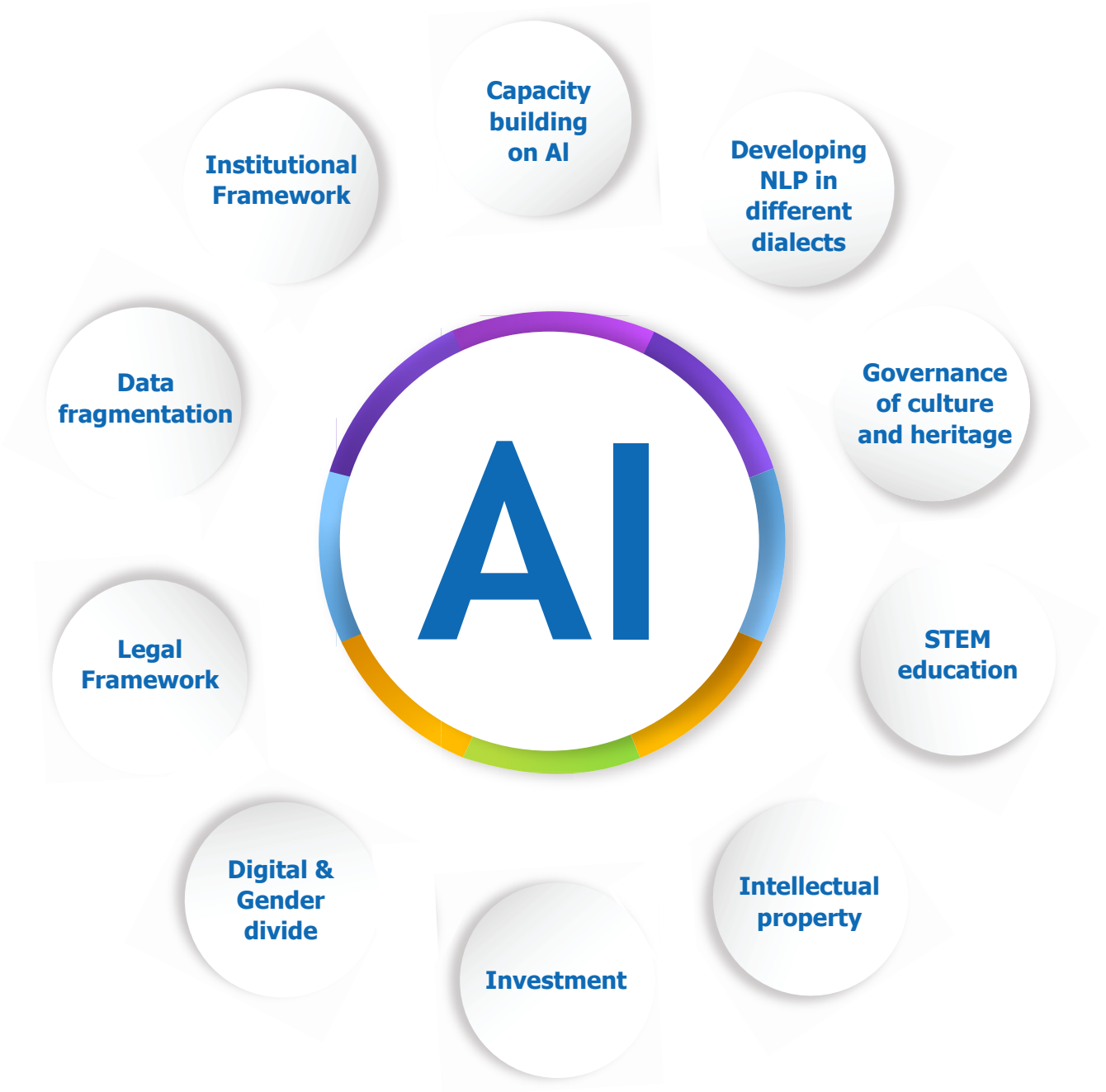
These expert contributions played a critical role in shaping the content and recommendations of the RAM report, ensuring it reflects a broad and inclusive understanding of Egypt's AI ecosystem.

Main Challenges Identified Through Previous Consultations

Experts from various stakeholder groups—engaged through consultation meetings and individual interviews—acknowledged that Egypt has made noticeable progress in deploying AI systems and integrating them into sectors such as health, agriculture, and justice. These efforts have been shaped by a commitment to ethical principles and the protection of human rights, contributing to Egypt's gradual improvement in global and regional rankings.

Over the past five years, these advancements have positioned Egypt with the potential and opportunity to further develop and apply AI across a range of sectors. However, the consultations also identified key challanges and areas of enhancement that must be addressed in order to build on this momentum. They are summarized as follows:

CHALLANGES AND AREAS OF ENHANCEMENT



Main Recommendations from Previous Consultations

The multi-stakeholder consultations led to a set of actionable recommendations designed to address Egypt's AI-related challenges and build a more inclusive, ethical, and sustainable AI ecosystem. Key priorities identified include:

- Finalizing a comprehensive legal and institutional framework for data protection
- Adopting a national legal roadmap specific to AI governance
- Enhancing STEM education and integrating AI into curricula
- Expanding upskilling and cross-skilling opportunities across sectors
- Developing Natural Language Processing (NLP) tools in various Arabic dialects
- Promoting the localization of data to ensure contextually relevant AI solutions

Additionally, participants highlighted the importance of:

- Strengthening domestic and international collaboration to digitize museum archives and preserve cultural heritage
- Increasing investment in human capital to build advanced, future-ready capabilities among the Egyptian workforce

These recommendations will be explained in depth in the next chapter.

MAIN POLICY RECOMMENDATIONS

Egypt has made significant advancements in the field of AI, improving its overall readiness. According to the Oxford Insights Government AI Readiness Index (2023), the country now ranks 1st in Africa, is among the top ten countries in the MENA region, and 62nd globally in AI preparedness. However, there remain opportunities to enhance ethical AI governance in Egypt.

To achieve this, the following recommended actions*:

REGULATION

Egypt has made tangible progress in AI legislation and regulation; however, noticeable legislative gaps remain

1. **Issue Access to Information Law**
   Establish a legal framework that guarantees public access to government-held data and information.
2. **Issue the Executive Regulation of the Personal Data Protection Law No. 151 of 2020**
   Enable the full implementation of the law by clarifying procedures and enforcement mechanisms.
3. **Issue a Data Sharing Law**
   Facilitate secure, ethical, and interoperable data exchange between stakeholders.
4. **Issue a Data Classification Law**
   Define and categorize data types clearly to promote trust, enable cloud infrastructure, and attract international investment.
5. **Adopt a Legislative Roadmap**
   Develop a clear timeline and process for the issuance and amendment of necessary laws before enacting a comprehensive AI law.
6. **Amend Law No. 182 of 2018**
   Introduce specific provisions for the procurement of AI systems by public entities to ensure transparency, accountability, and ethical use.
7. **Adopt a Balanced AI Law**
   Enact legislation that mitigates the risks associated with AI while simultaneously encouraging innovation and investment.

INSTITUTIONAL FRAMEWORK

Egypt has already taken significant steps toward developing its institutional framework for AI. However, there are still opportunities to enhance and expand this framework. Establishing a more comprehensive and coordinated institutional structure will further strengthen Egypt's overall readiness for AI.

1. **Localize data** to attract hyperscalers and create new job opportunities within the digital economy.
2. **Accelerate the establishment** of both the Personal Data Protection Center and the Center for Responsible AI to ensure regulatory and ethical oversight.
3. **Develop a comprehensive digital health policy** that integrates AI and mobile health technologies to improve healthcare access and quality, particularly in underserved rural areas.
4. **Create environmental policies** to evaluate and mitigate the ecological impact of AI technologies. Promote AI-driven sustainable practices, including resource optimization in agriculture and effective electronic waste management.
5. **Develop culturally aware AI applications** for automated translation and voice assistants. Establish a clear policy on using AI for the preservation of cultural heritage.
6. **Foster cross-sector collaboration** among government, the private sector, and academic institutions. Establish frameworks for joint AI projects targeting national development goals in sectors like healthcare, agriculture, and environmental sustainability.
7. **Provide incentives** for the private sector to adopt ethical AI. Develop a robust framework to monitor and ensure compliance with ethical standards in AI adoption.
8. **Develop sector-specific AI deployment** policies under the supervision of the National Council for Artificial Intelligence (NCAI), tailored to each government sector (e.g., Education, Healthcare, Judiciary).
9. **Increase investment in infrastructure**, particularly in data centers and cloud computing. At the same time, develop a regulatory framework to mitigate algorithmic bias and ensure fair AI deployment.

CAPACITY BUILDING

While AI has made significant progress across various sectors in Egypt, a comprehensive and inclusive capacity-building strategy should be adopted to ensure the involvement of all stakeholders using AI applications in these sectors.

1. **Foster innovation and research** by increasing investment in AI-related R&D and promoting stronger collaboration between academia and industry.
2. **Enhance and expand digital literacy programs**, especially targeting women and rural populations. This can include partnerships with technology companies to deliver training and certification in digital skills. Encourage more women to participate in STEM through scholarships, mentorship programs, and awareness campaigns highlighting the value of gender diversity in technology and innovation.
3. **Invest in cutting-edge laboratories and research facilities** to support innovative projects, attract top talent, and ensure accessibility and availability of relevant data.
4. **Develop human capital** by integrating AI education into curricula at all levels and promoting career pathways in AI to attract and retain talent.
5. **Embed foundational AI skills** in national educational systems to ensure that learners at all stages gain basic AI competencies.
6. **Attract international companies** to invest in and collaborate on AI projects in Egypt by creating a conducive innovation and investment environment.
7. **Support startups** by expanding access to global investment opportunities. Enhancing global market entry and customer access will accelerate AI adoption among local startups.
8. **Promote dynamic skill development and lifelong learning** by investing in skill sets rather than specific roles, which may become obsolete due to technological advancements.
9. **Increase capacity-building efforts in rural areas** to reduce the digital divide and invest in human capital to amplify workers' capabilities in the AI era.
10. **Address the challenges surrounding cloud computing adoption**, particularly those related to security and cost. As the expense of storing and processing large volumes of data rises, cloud infrastructure becomes essential. In this context, there is an urgent need to accelerate the passage of a data classification law to unlock the full potential of cloud-based AI technologies.

* The recommendations mentioned in this section are not exhaustive but are considered a high priority.

GOVERNMENT RESPONSE

The Government of Egypt extends its sincere appreciation to UNESCO for its support in conducting the AI Readiness Assessment for Egypt and for developing this forward-looking policy roadmap. The roadmap offers valuable recommendations that align well with Egypt's strategic priorities and ongoing efforts to develop a responsible, inclusive, and innovation-driven AI ecosystem.

Egypt welcomes the roadmap's recommendations, which are structured around three key domains: Regulation, Institutional Framework, and Capacity Building. These domains are strongly aligned with the pillars and initiatives of Egypt's 2nd edition of NAIS, launched in January 2025. The strategy is built around six main pillars — Governance, Technology, Data, Infrastructure, Ecosystem, and Talent — and includes 21 national initiatives aimed at strengthening the country's AI capabilities in a holistic and sustainable manner.

To reinforce policy coherence and ensure operational alignment, each of the roadmap's recommendations has been mapped, wherever relevant, to corresponding national initiatives. This exercise supports the integration of high-level strategic direction with targeted implementation pathways, while enhancing collaboration across government and non-governmental stakeholders.

These examples span all three core domains of the roadmap — Regulation, Institutional Framework, and Capacity Building — as demonstrated below:

Regulation

- The recommendation to issue the Executive Regulation of the Personal Data Protection Law No. 151 of 2020 is directly supported by Initiative 1: Egypt's National AI Regulatory System and Initiative 9: Ensure Data Privacy and Security, both of which aim to establish a strong legal and ethical foundation for data governance and personal data protection.
- The recommendation to adopt a Data Sharing Law and Classification Law/ Policy aligns with Initiative 6: Comprehensive Data Governance Frameworks and Standards and Initiative 8: Open Data and Data Exchange Platform, which are being developed through multi-stakeholder engagement to support secure and interoperable data exchange.

Institutional Framework

- The roadmap's call to accelerate the establishment of the Personal Data Protection Center and the Responsible AI Center is well aligned with Initiative 1 and Initiative 9, and both centers are already in advanced stages of operational planning.
- The proposal to develop sector-specific AI deployment policies under the supervision of the National Council for Artificial Intelligence (NCAI) aligns with Initiative 1 and Initiative 15: Industry-Academia-Research Platforms and supports the creation of tailored AI strategies across key government sectors such as healthcare, education, and agriculture.
- The recommendation to create environmental policies to mitigate the ecological impact of AI is in line with Initiative 13: Data Center Sustainability, which promotes responsible and energy-efficient use of AI technologies and infrastructure.

Capacity Building

- The roadmap's emphasis on promoting AI education, gender inclusion, and innovation-led research is closely reflected in Initiatives 20 ,18, and 21, which focus on human capital development, cross-disciplinary curriculum design, and national qualification systems.
- The recommendation to enhance digital literacy and increase women's participation in STEM is supported through national programs aligned with Initiatives 20 and 21, including targeted training, rural inclusion efforts, and awareness campaigns promoting gender diversity in tech.
- The focus on supporting AI startups by improving access to global investment and markets aligns with Initiative 16: Support for AI Startups in Egypt and Initiative 14: Active and Secure Investment Environment, aimed at boosting innovation and entrepreneurship.

Egypt views this mapping not only as a reflection of existing progress, but also as a mechanism to refine and guide future actions. The government reaffirms its commitment to responsible AI governance, inclusive development, and international collaboration in the field of emerging technologies.

In conclusion, Egypt values this collaboration with UNESCO and reaffirms its commitment to leveraging AI as a driver of inclusive and sustainable development. The government looks forward to continued partnership to further strengthen its AI governance and readiness, and to position Egypt as a regional and global leader in responsible AI.

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